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THE
JOURNAL
OF THE
ROYAL HORTICULTURAL SOCIETY
OF LONDON.

I. On the course of the Sap. By ANDREW MURRAY, F.L.S.

[First Paper, read to the Scientific Committee on 17th January, 1877.]

A GREAT revolution has of late years taken place in the ideas of vegetable physiologists regarding the course of the sap; and, what is very unusual, it has taken place silently, and with scarcely any discussion. One regrettable consequence of this has been that those who are out of the current of scientific unwritten opinion remain in ignorance of the change that has been coming over men's minds; and even those who are in the midst of it are sometimes in doubt what the verdict of the scientific world is. That this is so will be admitted by those who attended the Botanical Congress at Brussels in May last, where this question formed one of the subjects selected for discussion, and elicited much diversity of opinion; and that a like uncertainty still prevails here may be seen from the pages of more than one of our horticultural periodicals.

The old theory, as every one knows, was that the plants had a circulation similar to that of animals; that in the course of this the sap described two courses, an ascending and a descending one—the ascending course *to* the leaves, where it was submitted to certain influences which fitted it for the nutrition of the plant; the descending one *from* the leaves, in a condition fitted for that purpose. The modern view, or, if I may not say that, at least the view which has forced itself so strongly on my mind ever since Mr. Herbert Spencer's experiments that I have come to believe that every one must be of the like opinion, is that the sap describes only one course, viz., that from the root to the leaves, being drawn up by the power of the sun and other

concurrent influences. In its course it is like a great river, which, while steadily flowing to the sea, turns to the right or left as channels open for it until it reaches the delta near the termination of its course, which may be compared to the arrival of the sap at the leaves, when it flows in any direction, now dividing to the right and to the left, and again even regurgitating and flowing in a backward direction, but all these anastomosing together, and ending by emptying into the ocean, which for the sap is the atmosphere, into which its watery portion is drawn by evaporation from the surface of the leaves.

It is ten years since the paper by Mr. Herbert Spencer to which I refer, on circulation and formation of wood in plants (*Linnean Society's Transactions*, vol. xxv.), proved to demonstration that the sap ascended in the branches, and that while of course he could not prove a negative he at least showed that in none of his experiments could he get the sap to descend; he moreover gave a simple explanation of the deposit of wood by the sap oozing through the vessels on its way up, and depositing woody fibre around them. A few years later Professor W. R. McNab repeated and extended Mr. Herbert Spencer's experiments, with the same results, and showed that the sap ascended both by the vessels appropriated to its ascent, and by those supposed to be appropriated to its descent.

The grounds on which the descent of the sap has maintained its place in the belief of men are of three kinds, viz.: Inferences from, 1., Practical Horticultural Experiments; 2. from Physiological Experiments; and 3. from Chemical Experiments.

As to the first, the experiments seem to me when properly interpreted to be wholly opposed to the theory in whose favour they are cited. The growth of a callus on the upper side of a cut has been cited as one proof, but if it is tested it will be seen that while the lower side of the cut is rapidly covered over, that on the upper side takes years, and, what is more to the purpose, the callus grows almost entirely from the sides. Then a very favourite argument, which is usually supposed to be a knock-down blow, is, that if we tie a ligature round a branch, the branch swells above it as well as below it, but much more above than below, and it is said that this shows that there is a descending current which the ligature keeps back like a dam. But it is only a misapprehension of the phenomenon to liken it to a dam keeping back a descending stream. It is the case of a stream expanding itself when it finds space after its passage through a narrow

channel. Any stream, after being released from a narrow gully, behaves in this way, and the wide-spread waste of stones and gravel radiating like a fan from the mouth of a gorge is one of the most striking features of any landscape where this occurs.

2. As to the Physiological Experiments, these are chiefly the phenomena relied on by Sachs as warranting his conclusion that light is essential to assimilation, and that this can only take place in the leaves, and consequently that all assimilated products that are found elsewhere must necessarily have descended from the leaves in the form of elaborated sap. As to these, I would only say here that neither his facts nor his reasoning seem to me to bear out his conclusions.

3. As to the Chemical Experiments, it appears to me that it will be found on examination that there are in them more phenomena than one mixed up together, and that what was referable to the one has been applied to the other.

But it is not my object to attack these views on the present occasion. My immediate purpose is to ascertain, what according to the best lights of science we are expected to believe on the subject. I have thought that it might be desirable to elicit an expression of opinion on the subject from a body like this committee, whose competence to speak with authority on such matters is universally recognised. I know how difficult it is to supplant old opinions—what an exertion of magnanimity is required to acknowledge that we have been in the wrong. I remember, with sympathetic distress, the almost piteous remonstrance of a learned Professor at the Congress at Brussels, who, when interrupted in his argument about the descent of the sap by cries of “*Il n’y a pas de sève descendante*,” exclaimed, “There must be a descent of the sap. I have been teaching it for thirty years. What am I now to say to my students if there is no descent of the sap?” But the greater the difficulty the more the necessity for conquering such feelings, and putting the question on its right basis.

I am not at all blind to the consequences of adopting the view that I take. I know that if descent of the sap goes, the elaboration of any sap by the leaves beyond what is necessary for their own needs must follow. If it is not to descend, of what use is it to elaborate it in them, and why elaborate it by the leaves rather than by the roots or any other part? The nutrition of plants by free carbon-dioxide taken from the atmosphere through the leaves will also have to go. The nutrition of carnivorous plants will become still more difficult to comprehend, and other more remote corrections on received

ideas dependent on them must follow. I do not now concern myself with these; my present subject is the descent of the sap, and I respectfully suggest to the committee that they could not be more usefully or appropriately employed than in giving an authoritative expression of their opinion upon it. I do not ask, and indeed I would rather deprecate, a hasty, off-hand judgment on the spur of the moment, which in any view could only be regarded as the expression of individual opinion. What I would like to get is a deliberate, well-considered opinion after mutual consultation by the most eminent physiologists of our body.

[2nd Paper.—Read 17th July, 1877.]

BEFORE entering on the subject of this paper, it may be useful to mention—not for this Committee, but for the benefit of the outside world who may read the paper elsewhere—that they will find an excellent account of the present state of scientific opinion on the various questions connected with the sap, which I am about to discuss, in a series of papers that were published by Dr. Masters in the columns of the “Gardeners’ Chronicle” in 1874. On some he expresses himself with hesitation, on others with more confidence, on none with dogmatism, but on all he gives the full gist of the opinions generally received at the date of his writing.

With this premise I would recall to the memory of the Committee that at the beginning of this session I drew its attention to the course of the sap, being of opinion that recent researches rendered some modification in our views necessary on that subject.

The proposition that I submitted to the Committee was, pure and simple, that there was no such thing as descent of the sap at all, but that its course was always upwards. I obtained no collective expression of opinion from the Committee, but from the individual remarks of its members I gathered that they were quite in accord with me, so far as regarded anything like circulation. I think most of them, if not all, repudiated any belief in the old theory of the ascent of the sap by the fibro-vascular bundles of the wood and its descent by the cellular layers of the inner bark; but I found the majority still imbued by the theories of Sachs, and holding with him, and on his grounds, that descent by some means was absolutely necessary, in respect that assimilation could only take place in the light, and consequently that the whole of that

function must be performed in the leaf, whence the assimilated matter there produced must be transported in some way or other to the other parts of the plant in which it is found; and as these are lower down, and some of them even underground, as in the case of tubers, that it followed that there must be a descent in some way or other, and the prevailing opinion seemed to be that this took place by a slow swaying, or wandering motion, by means of endosmose and exosmose, through the walls of the cells, which imperceptibly and independent of the current of the sap mixed the whole up together, or carried the different ingredients to where they were wanted.

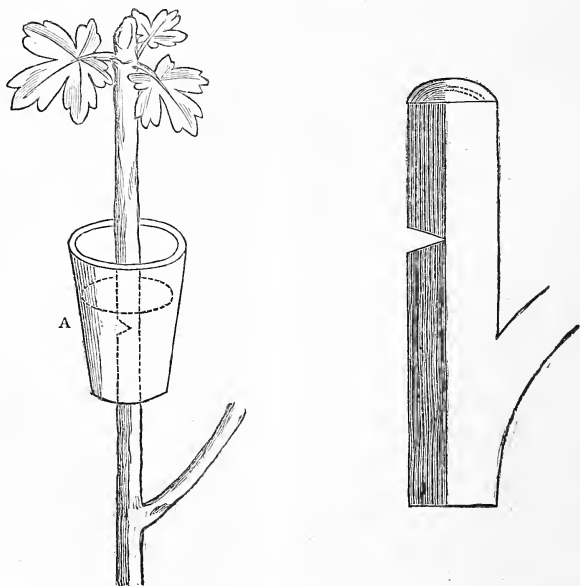
Since I last spoke on the subject I have endeavoured to see if actual experiment would throw any light upon it, and as a contribution to its elucidation I have now the honour to submit to the Committee the particulars of one or two experiments that I have made.

I made experiments with the Vine, the Fig, the Horse Chestnut, and the Hyacinth, but as they all, so far as they went, tended in the same direction, I shall speak principally from the Vine, which was much more manageable, and more readily took up my infusions than any of the others. Thanks to the experiments of Professor McNab and Professor Church, I knew of the virtues of lithia as an easily absorbed agent, whose presence could be detected anywhere by the spectroscope in however small a quantity it might be present, and I had the advantage of Professor Church's own kind assistance in determining for me whether it was present or not. As lithia, however, is colourless, I added to my infusions enough of litmus to colour them deeply, so that their course might be followed directly by the eye, and I am bound to record, as the result of my experience, that the lithia told me nothing that the litmus did not equally well. The combination of both, no doubt, adds to the confidence with which I can trust to my experiments, but the litmus had one great advantage over the lithia—that it might be easily handled, and dropped or spilt, without interfering with the experiment; whereas with lithia we have constantly to be on our guard against any careless dispersal of it—as, for instance, by allowing a drop to spill on the bark, or by using a knife that has been employed in cutting a portion of a branch that has been lithiated to cut one that has not. The form and proportion in which I used the lithia were five grains of citrate of lithia to each fluid ounce. To this I added a little glycerine, with the view of equalising the specific gravity of the mixture with that of the sap, and then as much as I found necessary of small lumps of

litmus. I need not say that I did not evolve these chemical details out of my own inner consciousness. I got them from my friend Professor Church, of Cirencester, who is my tower of strength in any chemical difficulty.

I may add, for the benefit of any outsider who wishes to repeat my experiments or make similar ones, that I got the citrate of lithia from Messrs. Hopkin and Williams, wholesale chemists, Cross Street, Hatton Garden; that its price is 1s. 6d. an ounce (480 grains), and that litmus is 3d. per ounce. I note this because I rather object to the kind of grandiose way we have got into of treating cost as too inferior a matter to be worthy of note, whereas, when we have put off our public robes, no one can dispute that cost is a vital consideration with us all. Whether a man has the income of an emperor or of a beggar, he has still to ask himself whether he can afford what he is about to do.

I then passed gutta-percha funnels over the shoots to be experimented on, and secured them as cups, with the shoots growing up the middle, by means of cork and tallow. I tried waterproof cloth, but it did not hold in—the gutta-percha funnels did perfectly. My experiments were made in April and May, when the leaves were beginning to open. I put one cup on the stem of the Vine.



It held perfectly, and no escape of the liquid took place. After the cup was properly luted to the stem with tallow I cut a nick in the stem a little above the fitting, and then filled the cup with the lithiated litmus-mixture, so as to cover the nick. I then allowed it to remain on for six weeks, constantly renewing the mixture in the cup as it disappeared.

After the expiration of six weeks I took up the plant and examined it; and here let me see that the Committee and I are in accord as to what I should have found had Sachs' theory been well founded. I imagine that on the ordinary principles of gravitation I should have found the vessels below the nick filled with the infusion in consequence of its descent. So far as regarded that part of the plant it was no longer a closed tube, and there could be no ascent, but being, as it were, merely an open tube, whatever was poured into it should simply find its way to the bottom. And so in fact it did—the infusion below the nick descended to the very fibrils of the roots. In like manner, the part above the nick being a closed tube—closed by the liquid in the cup at the bottom and by the leaves acting as a sucker at the top—we should expect that the infusion would ascend; and so it did, just as it descended below the nick. But how as regards the parts that were on the opposite side from the nick? According to Sachs' theory, whether you call it the result of metastasis or of endosmose and exosmose, the infusion should have been found extravasated and infiltrated through that side, both above the nick and below the nick and up the ascending branches, and everywhere a little; but in point of fact there was not the slightest extravasation nor a solitary particle of lithia or litmus in any of these places. The depth of the nick was the measure of the extent of the penetration of the infusion, and it was as sharply defined as a line could be; and this is just what I said should be the case.

I said that the rapidity of the current would prevent any intermingling of ingredients by endosmose or exosmose, just as a small boat finds a difficulty in getting into the current of a heady river, even with the external aid of oars, or a small stream pouring with the force of gravitation into a more powerful one is shoved aside and driven down the banks. A particle of sap has neither oars nor gravity by which to force its way from one part of the ascending current to another, and it must be content to go with the flow of that part of which it is a component particle. At night there can be no ascending current, for the force that produces it, the sun, is withdrawn, but the tube is full and in equilibrium.

To keep strictly within my experiences, I must explain that this is the result of all my experiments as regards litmus, and of all but that on the Vine as regards lithia. The experiment as to lithia in the uncut side of the Vine could not be tested, because I sent Professor Church the portions of the plant to be tested all cut up transversely, asking him to cut certain specified ones longitudinally, and then test the portions separately; but he explained that that would be a delusive test after the portions had travelled from London to Cirencester, for the lithia would have had time to pass by endosmose and exosmose from one side to the other, after the plant was cut in pieces—which of course it would, for there was no longer any current to prevent its infiltration; but the distribution of the litmus when the plant was newly cut showed clearly enough what the result of a search for lithia would have been at that time.

To my mind this is conclusive on the question. Sachs must be wrong; and we must now re-examine his arguments, and see where the flaw lies. If the Committee will allow me a few minutes, I do not think we shall have very far to seek. His position is thus stated in his "*Physiologie Végétale*":—

"The absolute necessity (says he) of the intervention of light for assimilation in plants with chlorophyll is proved directly by their mode of development in darkness. When we cause seeds to germinate in such conditions, roots, internodes, and leaves are developed generally in proportion to the mass of the seed. When all the provision of elaborated principles contained in it are exhausted, the development ceases. If up to that period the seed is allowed to germinate in the light, and it is then removed into darkness, the result is the same—the young leaves, although green, assimilate nothing; but if they are allowed to remain long enough in the light to have assimilated a little, there will be developed in darkness leaves and internodes until that new provision be exhausted also."

But there is one important fact that Sachs omits to keep in view here. If the plant in darkness assimilates nothing, neither does it take any food to assimilate. It is well known that plants do not feed in the dark, and nothing is easier than to prove it by experiment. Let any one with a Hyacinth growing in water in a glass, mark by a thread or narrow strip of paper glued to the glass the height at which the water stands at night; he will find it at the same height to-morrow morning, but very different to-morrow night. But the fact that they do not feed at night is universally acknowledged.

Now on what ground are we to hold that the reason why the plant does not assimilate is the absence of light in preference to the absence of food? Either will account for it, and one will suit Sachs' theory, but the other not. No doubt the food is not taken up during the absence of light, but not necessarily because of its absence; it may very well be, although it may be difficult, to show it experimentally that if the plant were placed in such conditions that it could take food generally, although secluded in darkness, we should find that assimilation went on as well in the dark as in the light; and this, in fact, is just what Nature does with tubers. They are in darkness while the plant is in light, and its feeding functions in full operation. They participate in the supply of food, although themselves in the dark, and from that source, as I view it, they receive and assimilate matter in as great abundance as any Apple in the blaze of sunshine. Sachs would say that the assimilated matter is drawn from the store produced by the plant generally. But what is this but to give the thing to be proved as part of the proof. He has to prove that assimilation cannot take place except in light. I offer an instance of its apparently taking place in darkness, and the reply is that that cannot be, because assimilation cannot take place in darkness. It is not that the fire will not burn because it is dark, but that it stops burning when the coals are consumed, because no more are supplied to it. During the day the light and heat of the sun draw up the sap to all the terminal parts of the plants, such as the axial extremities of the branches, the buds, the leaves, the tubers (which are only subterranean buds), where it is partly evaporated and partly assimilated—and as it is used up the roots absorb a corresponding flow to supply the consumption; but at night, when the motive-power is withdrawn, the upward flow of sap ceases, the roots become inactive and cease to feed, and assimilation ceases. At the same time there is nothing to hinder growth going on—it may pile cell upon cell, whether the machine is working or not, and it does so.

Allow me, however, further to cite a well-known fact in favour of my views, which it reflects no credit upon us not to have sooner so interpreted. Here am I narrating, and you listening to my clumsy experiments, and yet we have all had before our eyes—and our ancestors for ages have had them before theirs too—a constant series of beautiful and conclusive experiments, proving much more clearly than I have done what I have attempted to show. I allude to what we see in the case of grafts. We know that the stock has certain properties differing from those of the scion. We all know

that the properties of the stock affect the scion. They are carried up into its system, but those of the scion are not carried down into the stock. If the theory of descent and wandering and mixing of the sap were true, the qualities of the scion ought to descend just as much as those of the stock ascend, but they do not. But some one may say, "Oh, but you are wrong; there are cases in which the influence of the scion has made itself felt on the stock." How many? I ask. Out of the myriads of grafts that are made every year we hear perhaps once in a decade of some single plant where there is a doubtful appearance of a scion having had some influence on a stock, or, rather, on a shoot from one. Now, if I disputed the fact altogether of such an influence ever having been truly seen, I think I should have plenty of supporters, and I am not sure that I should not be in the right, but I am not careful to do this thing. I am willing to take it as possible that such a thing may have, and that such a thing has occurred, but I add that it is still capable of explanation in accordance with my interpretation of the flow of the sap. It will be observed that such cases have never been observed until after the lapse of a winter after the grafting, and, in fact, it is nearly impossible that they should. Now although I maintain that there is no descent of the sap, I never did (and could not) deny that there is a period (winter) when it no longer flows at all. The liquid part of the sap is evaporated, the more solid part is dried up, deposited or crystallised, or what is called "stored up" for next year. I imagine that this takes place pretty much simultaneously all through the plant, so that there is little sinking of the column of sap in the vessels. But it is possible that under conditions when there is an unusually large supply of sap in the vessels at the approach of winter, or in plants whose vessels are favourably constructed for it, there may be something like a disturbance of equilibrium, which will allow the sap to ebb, so that a portion of what properly belongs to the scion floating on the top of the tide may fall below the graft, and, being there stored up until redissolved and carried up next year, may give rise to the doubtful phenomenon of which I speak; but I take my stand, not upon exceptions, but on the broad basis of an all but universal experience throughout the whole world.

I meant to have stopped here, but I am in the position of a man, who, having begun to take a rotten beam out of an old house, finds a whole superstructure of dependencies, offsets, and rookeries tumbling about his ears. The system of vegetable physiology now in credence was built up on the faith of the existence of a circulation

of the sap, and everything has by degrees been arranged to fit neatly into it. That rotten beam was removed and its place supplied by Sachs' theory; that, I think, I have shown to be rotten too, and in removing it, without having any other prop to put in its place, down must come the hypothesis that the plant derives all its carbon from carbonic acid in the atmosphere, or its nitrogen from free uncombined nitrogen through the leaves, and all power of taking anything into the system through the leaves, and, of course, all hypothesis of feeding, whether vegetarian or carnivorous, through these organs must be given up too. The theories of circulation by imbibition, diastasis, endosmose, and exosmose, for me are already defunct. Six weeks unavailing effort to get the slightest indication of any of these phenomena in the living plant seem enough for me. The current is steadily upward, and not only permits nothing to come down against it, but is too powerful to permit anything to deviate from its own place, and force its way into another, even by uniting with it on the way upwards. My position, therefore, is that for a plant to absorb carbonic acid through the leaves for the purpose of supplying it with that important element involves a physical impossibility, and yet this is one of the best received vegeto-physiological hypotheses. It has the advantage of giving a glimmer of an explanation how plants may have first originated. They consist of carbon, nitrogen, and mineral ingredients, besides oxygen, which may be derived from the latter, and it is open to say that plants derive their mineral constituents from the degradation of rocks, and their carbon and nitrogen from the atmosphere—and I do not say that some plants (as lichens) do not. But whatever laboratory experiments may say, if we test the hypothesis by the rules of common sense and common experience, they tell us that you may try to grow a plant in mineral ingredients and leave it to get its carbon from the atmosphere as much as you like but it won't grow. As far as common people can see it will only thrive in humus, in other words, where its roots can draw carbon from the organic matters already elaborated in the soil by the long-continued accumulation of past ages. But Sachs states the point very broadly. "The fact is unquestionable," says he, "partly established by direct researches on vegetation, partly inferred from the circumstances under which many plants live in a natural condition, that most plants which contain chlorophyll (*e.g.*, our cereal crops, Beans, Tobacco, Sunflower, many saxicolous lichens), Algæ, and other water plants obtain" (through the leaves—he does not say so here—but it is implied, and is of the essence of his theory) "the entire quantity

of their carbon by the decomposition of atmospheric carbon dioxide, and require for their nutrition no other compound of carbon from without." (Sachs' *Text-Book* (Dyer's Trans.), p. 620.)

Now in the first place one of the principal of the circumstances to which he certainly above alludes must be the influence of light on assimilation, his interpretation of which I have just endeavoured to refute. If that is wrong the unquestionableness of his fact disappears. Next I may mention another phenomenon which seems to me equally adverse to his views, viz., that the plants of which we are speaking exhale oxygen during the day and carbon during the night. If carbon in whatever form passes up from the root to the leaves during the day, and a chemical decomposition takes place whereby it or other ingredients are altered in its way oxygen must be liberated, and after being carried on with the stream of sap will be set free when it reaches the leaves, while the carbon will be used up in the plant; and this is just what takes place by day. But at night, when no feeding or assimilation is going on, no flow of matter on which chemical action can act takes place either, but the carbonic acid with which the sap is charged, or which is one of its ingredients, escapes through the thin cuticle of the leaf as from a vessel left open without any interchange of oxygen at all.

As to the experiments referred to by Professor Sachs, I believe that the principal one was made by De Saussure about the beginning of this century (1805), but unhappily I have been unable to see the paper containing it. As recorded, Saussure's experiment proved that plants in sunlight increase in their amounts of carbon, hydrogen, and oxygen at the expense of carbonic acid and water. But there is no indication whether he attempted to determine whether the carbon was taken up by the leaves or the roots; and as that was not what he was trying to find out, I am disposed to infer that no precautions were taken to decide that point. He seems to have been very careful in measuring the contents and constituents of the air, the plant, and the earth; but as it is plain, from that very fact, that they were all three subjected to the same experiment at the same time, I do not imagine that the experiment could touch our point. The more recent experiments of Moll would require more space for discussion than I can give, but properly interpreted, and eliminating some which, I think, proceed on mistaken assumptions, I do not consider them adverse to my views.

It must not be inferred that I dispute altogether the possibility of the air supplying a portion of its carbon to the plant. Carbonic

acid may be carried down into the earth by showers, and there put in a fit condition for the plant, which may then take it up by the roots. All that I say is, that it does not enter free into the plant through the leaves, and that the idea of its descending from them, and supplying the plant with carbon for its structure, infers an absolute impossibility.

With a glance at one other class of experiments which bear on this point I have done. I do not know that Sachs has relied on it, but other physiologists have. It has been maintained that not only carbolic acid, but nitrogen free and uncombined, is taken up by the plant through its leaves, and it is plain that if the one can be so taken up there seems no very good reason why the other should not be also—possibly not so readily—but still, taken up. Both are constituent gaseous elements of the plant, and if it can take up the one by the leaves, it might reasonably be expected that it should also be able to take up the other. Now with nitrogen the question has been fairly tried by many first-rate chemists and physiologists, and a great multitude of experiments have been made, and although discrepancies have occurred on points which do not concern this question, I think I may say that, with one exception (De Villa, whose authority is nothing equal in weight to that of most of those opposed to him), the conclusion has been unanimous in the negative. It would be tedious to mention all the experimenters, but when I name Bous-singault as commencing the inquiry and Lawes and Gilbert terminating it, no question as to its efficiency can arise. The concluding words of Mr. Lawes are “in view of the evidence afforded of the non-assimilation of free nitrogen by plants under the wide range of circumstances provided in the experiments it is desirable that the several actual or possible sources of combined nitrogen to plants should be more fully investigated both quantitatively and qualitatively.”

In conclusion, I trust that others will repeat my experiments and weigh my arguments. It is a very self-confident thing for a man to set himself up in opposition to views entertained by all the *heroes scientiæ* of his own time, and although I own that I am not generally much troubled by reverence for authority, I still feel that I shall not be sure whether I have been wise or impudent in writing this paper until I have my experiments repeated and confirmed by independent workers.

II. REPORT on the Bedding Varieties of Zonal Pelargoniums Grown at Chiswick by the Floral Committee of the Royal Horticultural Society, 1876.

THE collection grown this season was chiefly composed of the older and approved varieties, it having been determined by the Committee to prove all the new sorts in pots the first season, and to bed them out the following if worthy of retention, excepting the variegated section and some few that were recommended solely as bedding varieties. This arrangement enables the Committee to discard many worthless and synonymous varieties the first season, and to secure a requisite number of plants of good quality for planting out, a difficulty having always been experienced in securing the newer sorts sufficiently early in the season, or of sufficient vigour, to give them a fair trial the first season.

The season was not a favourable one for the flowering varieties; but the foliated or variegated section, on the contrary, grew most satisfactorily.

The following is a list of the donors:—Bull, W., Chelsea; Bell and Thorpe, Stratford-on-Avon; Carter & Co., High Holborn, W.C.; Clark, J., Cothelstone House, near Tatum, Somerset; Creed, J. J., Whittington House, Chesterfield; Cocker & Son, J., Sunnypark Nurseries, Aberdeen; Cannell, H., Swanley Junction, Kent; Chater, J. J., Gonville Nurseries, Cambridge; Denny, Dr., Stoke Newington; Dickson & Co., Edinburgh; Davis, S. The Cemetery, Maidstone, Kent; Dean, R., Ealing; Dodds, W., Bishopston, Bristol; Fraser, John, Lea Bridge Nurseries; Garroway & Co., J., Bristol; George, J., Putney Heath; Henderson & Son, E. G., Wellington Nursery, N.W.; Hodgson, J., Thomas Street, Woolwich; King, J., Allanbury Park, Binfield, Berks; Kinghorn, F. R., Sheen Nursery, Richmond; Kneller, N., Malshanger Park, Basingstoke; Laing, John, Stanstead Park Nurseries; Little, H., Cambridge Villa, Twickenham; Lee, J. & C., Hammersmith; Methven & Sons, Thomas, Edinburgh; Miles, F., Bingham Rectory, Notts; Meus, —, Chiswick House; Osborn & Son, Fulham; Pearson, J. R., Chilwell, Notts; Paul & Son, W., Waltham Cross; Porter, —, Sion Lodge, Isleworth; Plestir, W., Elsenham Hall Gardens, Bishop Stortford; Smith, G., Hedge Lane, Edmonton; Smith, F. and A., Dulwich; Tipping, E. P., Sheendale Villas, Richmond; Turner, C., Royal Nurseries, Slough; Veitch & Sons,

J., Chelsea; Wimsett, J., King's Koad, Chelsea; Wells, C., Selwyn Court, Richmond; Webb, H., Redstone Manor, Redhill.

*** Denote those that have been awarded First-class Certificates.

I. FLOWERS SCARLET.

Hybrid Nosegay.

Leaves Zonate.

1. *General Outram*. Free spreading habit; free flowering; trusses large; rich dark scarlet. Certificated 1874.
2. *Wellington* (Denny). Strong vigorous habit; foliage pale green, zonate; trusses large; flowers large, dark scarlet. Previously certificated.
3. *H. M. Stanley* (George). Bushy habit; trusses large; flowers large, very bright scarlet, best of its class. Previously certificated.
4. *Bret Harte* (Miles). Shy flowering; inferior.
5. *Bonfire* (Paul). Straggling loose habit; very free flowering; bright scarlet. Previously certificated.
6. *Vesta* (Paul). Very similar to *Bonfire*.
7. *Mrs. Mellow* (Pearson). Shy flowering; not desirable.
8. *Murillo* (Paul). Plant of erect habit; trusses small and compact; deep scarlet, shaded faintly with crimson.
9. *Chatsworth Speed* (Pearson). Loose straggling habit; trusses medium sized, compact; deep scarlet; now superseded.
10. *Terence* (Paul). Good compact habit; trusses large; flowers large; freely produced; bright scarlet.
11. *Milton* (Pearson). Spreading loose habit; trusses large and very loose; inferior.
12. *Concord*. Spreading habit; free flowering; trusses medium sized; flower medium sized, bright scarlet.
13. *Wm. Thomson* (Pearson). Inferior.
14. *Shakespeare*. Dwarf-spreading habit; very free flowering; trusses large; the petals long and narrow, bright scarlet.
15. *Lord Belper* (Pearson). An inferior variety.
16. *Bayard* (Pearson). Similar to Lord Belper.
17. *Rev. J. Wooley* (Pearson). Spreading habit; free flowering; trusses large; flowers large, bright scarlet.
18. *Duke of Devonshire* (Pearson). Plant of good dwarf habit; free flowering; trusses medium sized; flowers medium sized, bright scarlet. Previously certificated.
19. *Waltham Seedling* (Paul). Dwarf-spreading habit; very free

flowering; trusses large; the petals long and narrow. Previously certificated, now confirmed.

20. *Sheendale Nosegay* (Tipping). Free spreading habit; shy flowering; trusses large; the petals narrow.

II. FLOWERS PALE ORANGE-SCARLET.

Leaves Zonate.

21. *Chunder Sen*. Plant of free vigorous habit; free flowering; trusses medium sized; flowers medium sized, bright orange-scarlet. Previously certificated.
22. *Soleil* (Veitch). Similar to *Chunder Sen*. Previously certificated. Now confirmed.
23. *Triomphe de Stella* (Garaway). Dwarf compact habit; free flowering; trusses small; orange-scarlet. A first-rate bedder. Previously certificated. Now confirmed.
24. *Harry Hieover*. Plant of exceedingly dwarf close habit; free flowering; trusses small; flowers small, pale scarlet. A fine bedder for front edging. Previously certificated.
25. *Anna Pfitzer* (E. G. Henderson & Son). Plant of spreading habit; free flowering; trusses large; the petals narrow, pale scarlet. Previously certificated.
26. *Ouryer* (Pearson). Free, rather spreading habit; free flowering; trusses large; flowers medium sized, pale orange-scarlet. Very good.
27. *Grand Duke* (G. Smith). Plant of moderate compact habit; trusses large; flowers large, of fine form, vermilion-scarlet, shaded with lake. Previously certificated.
28. *Orient* (Miles). Plant of good compact habit; trusses very large; flowers medium sized, orange-scarlet. Discarded.
29. *Prince Arthur* (Pearson). Plant of compact close habit; the stems marbled, and with very distinct zone in leaf; trusses of medium size; flowers medium, bright orange-scarlet.
30. *Congress* (George). Plant of strong vigorous habit; free flowering; trusses large; flowers large, pale scarlet.
31. *Mrs. J. George* (George). Plant of free rather spreading habit; very free flowering; trusses large; flowers large, of fine form, pale orange-scarlet. Previously certificated.

III. FLOWERS LAKE-ROSE.

Leaves Zonate.

32. *Arthur Pearson* (Pearson). Plant of moderate growth; free

flowering; trusses medium sized; flowers of medium size, rose with a slight shade of magenta. Previously certificated.

33. *Laurence Heywood* (Pearson). Plant of strong but compact growth; free flowering; trusses large; flowers large, of fine form, rose with a tinge of purple; a very showy variety. Previously certificated.
34. *Violet Hill Nosegay* (E. G. Henderson & Son). Plant of fine dwarf compact habit; very free flowering; trusses small; flowers large, rose coloured; a splendid variety. Previously certificated.
35. *Lady Kirkland* (Downie & Co.). Free compact strong habit; very free flowering; trusses of immense size; flowers large, bright purplish-rose. Previously certificated.

IV. FLOWERS SCARLET SHADED WITH MAGENTA.

Leaves Zonate.

36. *Caxton* (Pearson). Plant of moderate compact habit; leaves plain green; trusses medium sized, compact and close; flowers medium sized, scarlet shaded with magenta. Previously certificated.
37. *Sparkler*. Plant of good free-growing habit; free flowering; trusses large and compact, well displayed; scarlet shaded with magenta. Previously certificated.
38. *Mrs. Turner* (Dickson). Very similar to *Caxton*.
39. *Argus* *** (Paul). Plant of free spreading habit; free flowering; trusses large; flowers large, of good form, with conspicuous white eye, scarlet shaded with magenta. Distinct and good.
40. *Athos* (Pearson). Plant of bushy habit; leaves small, zonate, and somewhat cupped; free flowering; trusses large and very close; flowers of medium size, scarlet shaded with magenta.
41. *A. Rivers* *** (Pearson). Plant of tall branching habit; very free flowering; trusses very large; flowers of medium size, scarlet shaded with magenta.

V. FLOWERS SCARLET.

Leaves Zonate.

42. *Rosa Little* (H. Little). A dwarf habited variety; free flowering; trusses large, erect; flowers large, of fine form, deep scarlet with a small white eye. Certificated 1875.
43. *Mark Twain* (F. Miles). Plant of dwarf-growing compact

- habit; leaves distinctly zonate; very free flowering; trusses large; flowers large, of fine form, deep opaque scarlet. A splendid variety. Previously certificated.
44. *Vesuvius* (F. and A. Smith). A well-known variety.
 45. *Shakespeare* (Denny). Inferior.
 46. *Tyrsal Rival* (Laing). Dwarf compact growing variety; free flowering; trusses large; flowers large, of fine form, rich scarlet with a rather small white eye.
 47. *The Spencer*. Loose habit; free flowering; trusses large; flowers large, bright scarlet. Discarded.
 48. *Tom Taylor*. Very shy flowering. Inferior for bedding purposes.
 49. *Rose of Summer* ***. Plant of fine dwarf habit; free flowering; trusses large; flowers of medium size, pale scarlet.
 50. *Corsair* (Pearson). Habit strong and robust; trusses medium sized; flowers large, of fine form, orange-scarlet. More suitable for pot culture.
 51. *John West* (King). Plant of free good habit; free flowering; trusses large; flowers large, orange-scarlet. A promising variety.
 52. *Iago* (Denny). Plant of free habit; shy flowering; trusses and flowers of medium size. Unsited for bedding.
 53. *John Watson* (Pearson). Plant of free growing good habit; free flowering; trusses very large; flowers large, scarlet with a shade of purple. Good.
 54. *Moxham* (Denny). Tall branching habit; flowers large and fine; shy flowering. Inferior for bedding.
 55. *Wonderful* (Smith). A semi-double *Vesuvius* possessing all the qualities of that well-known variety.
 56. *Aurora* (semi-double) (Laxton). Of the *Tom Thumb* type; free flowering and good.

VI. FLOWERS SCARLET WITH WHITE EYE.

Leaves Zonate.

57. *A. F. Barron* (George). Fine dwarf compact habit; free flowering; trusses large; flowers large, of fine form, scarlet with white eye. A fine variety.
58. *Harry King* (E. G. Henderson & Son). Habit moderately vigorous; trusses of medium size, freely produced; flowers of fine form, scarlet with white eye. Previously certificated.
59. *Empress of India* (Porter). Tall loose habit. Inferior.

60. *Richard Dean* (George). Free good habit; free flowering; trusses large; flowers large, scarlet with white eye. Previously certificated.
61. *Excelsior* (Denny). Plant of spreading habit; free flowering; trusses large; flowers large, scarlet with white eye. Good for pot culture.
62. *Prince Arthur* (Fraser). Resembles *Harry King*.
63. *Don Giovanni*. Inferior.
64. *Grand Duchess*. Inferior.
65. *The General* (Paul). Plant of loose branching habit; free flowering, scarlet with white eye; the petals quickly fall off.
66. *Theocritus* *** (Paul). Good habit; free flowering; trusses and flowers large, deep scarlet, with conspicuous white eye. Good.
67. *Jean Sisley* (Cannell). Good compact habit; free flowering, but sheds its flowers quickly.
68. *De Lcsseps*. Dwarf bushy habit; free flowering; trusses medium sized; flowers large, scarlet with white eye.
69. *Archbishop of Paris*. Good compact habit; shy flowering. Inferior for bedding.
70. *Achilles* (Denny). Good compact habit; free flowering; trusses of medium size; flowers large, pale scarlet with distinct white eye. Discarded.
71. *Emily Moreland*. Like *Achilles*. Discarded.
72. *Prince Charlie*. Shy flowering. Discarded.
73. *Marechal MacMahon*. Spreading habit; trusses and flowers large. Now superseded.
74. *Diana*. Shy flowering. Discarded.

VII. FLOWERS SCARLET.

Leaves Plain Green.

75. *Duke of Sutherland* *** (F. and A. Smith). Free vigorous habit; free flowering; trusses large; flowers large, bright scarlet.
76. *Warrior* (G. Smith). Very similar to *Duke of Sutherland*; better habit. Previously certificated.
77. *Dell* (Pearson). Shy flowering. Inferior.

VIII. FLOWERS PALE SCARLET.

Leaves Plain Green.

78. *Red King* *** (Cocker & Son). Plant of very close compact

growth ; very free flowering ; trusses of medium size ; flowers medium sized, pale scarlet. Good.

79. *Col. Wright* (Pearson). Plant of free spreading habit ; free flowering trusses, and flowers of medium size, pale scarlet. Previously certificated.

IX. FLOWERS CRIMSON-SCARLET.

Leaves Plain Green.

80. *Mrs. Vincent*. Plant of good compact growth ; free flowering ; trusses large ; flowers large, scarlet shaded with crimson. Previously certificated, now confirmed.
81. *Rev. F. F. Fenn* (Pearson). Plant of medium vigour, rather erect growth ; trusses large and full, well displayed ; very free flowering ; flowers of medium size, the petals long and narrow, rich crimson-scarlet. Previously certificated. A splendid variety.

X. FLOWERS CERISE AND ROSE.

Leaves Zonate.

82. *Lucius*. Plant of free vigorous growth ; very free flowering ; leaves very dark green with distinct zone ; trusses and flowers of medium size, cerise ; stands the weather well. Previously certificated, now confirmed.
83. *Princess of Wales* (Mews). Plant of strong vigorous growth ; trusses large and handsome ; of a paler shade than *Lucius*. Previously certificated, and now confirmed.
84. *Harvest Moon*. Very similar to *Princess of Wales*.
85. *Regalia* (Turner). Plant of medium growth ; very free flowering ; trusses large and somewhat loose. Previously certificated.
86. *Dr. Newham*. Dwarf spreading habit ; the stems marbled ; inferior.
87. *Forester* (Carter and Co.). Plant of strong vigorous growth ; free flowering ; trusses small ; flowers of good form, pale rose. Previously certificated.
88. *Climax*. Very strong vigorous growth ; somewhat shy flowering ; pale rose.
89. *John Riddell* (Cocker). Like *Climax* ; of more compact habit.
90. *Lady Selwyn* (Wells). Tall branching habit ; shy flowering inferior.

91. *John Fraser*. Plant of free good habit ; rather shy flowering trusses and flowers of medium size ; deep rose.
 92. *Claude de la Meurthe* (E. G. Henderson and Son). Plant of moderately vigorous growth ; free flowering ; leaves cupped and deeply serrated ; faintly zoned ; trusses of medium size ; rose shaded with magenta, or a bright amaranth rose, a colour very difficult to designate, being so very distinct. Previously certificated. A first-rate variety.
 93. *Ianthe* *** (Denny). A dwarf close habited variety ; free flowering ; trusses and flowers of medium size ; rose shaded with purple ; the best habited variety of the class.
 94. *Dr. Hill*. Similar to *Ianthe*, but of stronger growth.
 95. *Mrs. Grover*.
 96. *Rev. J. Downie*.
- } These are inferior varieties.

XI. FLOWERS PALE PINK.

Leaves Plain Green.

97. *Christine* (Kingham). Very close habit ; free flowering ; trusses and flowers of medium size ; very pale pink.
98. *Christine Surpasse*. Stronger growth than *Christine*, and with larger flowers ; not so free flowering.
99. *Bella* (Pearson). Plant of rather tall habit ; very free flowering ; trusses of moderate size ; flowers medium sized, pale rose-pink.
100. *Margaret*. Very inferior ; leaves zonate.

XII. FLOWERS ROSE-PINK.

Leaves Plain Green.

101. *Mrs. Augustus Miles* (Pearson). Plant of slightly straggling habit ; very free flowering ; trusses large ; flowers large, bright rose-pink, upper petals distinctly marked with white. Previously certificated.
102. *Mrs. Holden* (Pearson). Clear rose-pink ; inferior for bedding purposes, but does well in pots.
103. *Mrs. Tate* (Pearson). Plant of dwarf spreading habit ; free flowering ; trusses and flowers large ; deep rose-pink, distinctly marked with white on the upper petals.
104. *Mrs. Ffytche* (Pearson). Similar to *Mrs. Tate*.
105. *Mrs. Halliburton* (Kingham). Plant of free bushy habit very free flowering ; trusses of medium size ; flowers small rose ; a good variety. Previously certificated.

106. *Lady Emily* (Pearson). Plant of thick bushy compact habit; somewhat shy flowering; trusses very large; flowers large, clear rose-pink, the upper petals distinctly blotched with white. Previously certificated.
107. *Master Christine*. Good bushy habit; free flowering; trusses and flowers large; rose-pink, upper petals distinctly marked with white. Previously certificated.
108. *Lady Belper* *** (Pearson). Plant of compact good habit; free flowering; trusses and flowers large; clear rose-pink slightly shaded with lilac. Very fine.
109. *Cleopatra* (Barnett). Plant of moderately dwarf habit; free flowering. A splendid variety. Previously certificated.
110. *Madam Barre*. Very inferior.

XIII. FLOWERS ROSE-PINK.

Leaves Zonate.

111. *Rose of Allandale* (Denny). Plant of free habit; free flowering; trusses medium sized; flowers large and of good form, well displayed, clear rose-pink, with white on top petals. A fine variety.
112. *Surpasse Beauté de Suresnes* (Low). } These three are all in-
 113. *Mrs. Kent*. } ferior, being very shy
 114. *Charlie King*. } flowering.

XIV. FLOWERS PINK SHADED WITH PURPLE.

Leaves Plain Green.

115. *Florence Durand* (Pearson). Plant of vigorous habit; free flowering; trusses and flowers large, rose-pink shaded with purple, the upper petals distinctly blotched with white. Previously certificated.
116. *Mrs. Turner* (Pearson). Plant of strong vigorous growth; very free flowering; trusses very large; flowers large, the petals narrow, rose-pink shaded with purple. Previously certificated.
117. *Mrs. Gibbons* (Pearson). Of stronger growth than *Mrs. Turner*, but otherwise similar.
118. *Amaranth* (Pearson). Plant of free good habit; free flowering; trusses large and compact deep rose-pink; with a shade of purple. Previously certificated.

XV. FLOWERS PINK SHADED WITH PURPLE.

Leaves Zonate.

119. *Pink May Queen* (Downie & Co.). Plant of remarkably

strong growth; free flowering; trusses very large; flowers of good form, pink shaded with lilac. Previously certificated.

120. *Hettie* (Miles). Not so free flowering as *Pink May Queen*, but otherwise similar.
121. *Lucy* (Pearson). Tolerably compact habit; free flowering; trusses of medium size; flowers of medium size, bright rose-pink with a slight tinge of purple.
122. *Mrs. F. Barnaby*.
 123. *Mrs. Musters*. } Inferior to those described.

XVI. FLOWERS SALMON.

Leaves Zonate.

124. *Vanessa* *** (F. Miles). Plant of moderately vigorous habit; free flowering; trusses large and bold; flowers large, of a uniform salmon colour. Very showy and distinct.
125. *A. K. McNab* (Laing). Very similar to *Vanessa*.
126. *Forest Hill Nosegay* (Downie & Co.). Plant of dwarf and compact habit; free flowering trusses and flowers large, salmon-cerise.
127. *President Thiers*.
 128. *Salmon* (Hodgson).
 129. *Beauty of Suffolk* (Dodds). } These are all shy flowering and inferior.
 130. *Fatinze*.

XVII. FLOWERS OCULATE.

Leaves Zonate.

131. *Lucretia* (George). Plant of free-growing branching habit; free flowering; trusses and flowers of medium size; white shading to bright rose towards the eye.
132. *Eugénie Mézard* (Salter). Plant of dwarf compact habit; very free flowering; white shading to salmon towards the eye. Good. Previously certificated.
133. *Mrs. Dodds*. Plant of good bushy habit; free flowering, and good, but now superseded.
134. *Princess Alice* (E. G. Henderson & Son). Plant of good habit; free flowering, and good.
135. *Belle Esquemoise*.
 136. *Madam Vendel*. } Inferior varieties.

XVIII. FLOWERS WHITE.

Leaves Zonate.

137. *Snowdon* *** (Denny). Plant of dwarf close habit; free

flowering ; trusses large ; flowers large, of fine form, white faintly shaded with pink. A good white variety both for pot culture and for bedding.

138. *Purity* (Bull). Plant of robust vigorous growth ; free flowering ; trusses large ; flowers of medium size, of fine form, almost pure white. Previously certificated.
139. *White Clipper*. Shy flowering, and inferior.
140. *White Princess*. Similar to *White Clipper*.
141. *White Swan* (D. Laird and Laing). A very stunted variety ; very inferior.

XIX. GOLDEN TRICOLOR VARIETIES.

These have been arranged into five distinct groups, the varieties composing which are very similar.

Group I.

Leaves large, broad, with broad greenish-yellow margin, and narrow bronzy-red zone. Flowers scarlet.

142. *Mrs. Pollock* ***. A fine free-growing variety, and still one of the best. Previously certificated.
143. *Amy Richards*. Leaves large, flat, of a somewhat weak constitution.
144. *Countess of Ashburnham* (E. G. Henderson & Son). A very robust and strong-growing variety. By far the strongest growing of all the tricolors, the leaves large and well-marked. A splendid variety.
145. *Fair Emily* (F. and A. Smith). Of somewhat brighter colour than *Mrs. Pollock*.
146. *Louisa Smith*. Of fine dwarf habit. A good variety.
147. *Prince Arthur* (E. G. Henderson & Son).
148. *Iron Duke* (E. G. Henderson & Son).
149. *Leander* (E. G. Henderson & Son).
150. *Sophia Cussack*.
151. *Templar* (E. P. Tipping).

} These are all
very similar
to *Mrs. Pollock*.

Group II.

Leaves rather small, and frequently cupped ; narrow yellow margin, with broad dark reddish zone. Plants of fine dwarf compact growth.

152. *Lady Cullum* (Grieve). Plant of fine free growth. A very useful variety either for pots or bedding. Previously certificated.

153. *Florence* (Wills). This is identical with *Lady Cullum*.
 154. *Lady Sheffield* (E. G. } These bear a great resemblance to
 Henderson & Son). }
 155. *Eastern Prince*.

154. *Lady Sheffield* (E. G. Henderson & Son).
155. *Eastern Prince*. } These bear a great resemblance to *Lady Cullum*.

155. *Eastern Prince.*

Group III.

Leaves small, round, of a pale green colour; the margin narrow, clear golden; zone of a clear bronzy-red. Plants of very compact bushy habit. Flowers scarlet.

156. *Sophia Dumaresque* (E. G. Henderson & Son). Plant of fine free-growing habit.

157. *Bright Eyes* *** (E. G. Henderson & Son). Plant of very fine dwarf habit. This is a very pretty and attractive variety.

158. *Plutarch* (Paul).) Previously certificated. These are

159. *Mrs. Turner* (Turner). } very similar to *Sophia Dumaresque*.

Group IV.

Leaves large, broad, flat; the margin clear golden; zone very broad and distinct, of a dark bronzy-red colour; flowers scarlet.

160. *Macbeth* (Bell & Thorpe). Plant of very strong robust growth; foliage large and flat; distinct dark zone. A splendid variety. Previously certificated.

161. *Col. Loyd Lindsay* (E. G. Henderson and Son). A very free growing variety, with large flat leaves.

162. *Home Influence* (E. G. Henderson & Son). Leaves rather
smaller than the preceding; zone very bright and clear. A
promising variety.

163. *Peter Grieve.*

164. *Angelina*.

165. *Beautiful Star.*

166. *W. E. Gladstone.*

167. *Princess Mary.*

Group V.

Leaves small; narrow golden margin; zone broad, very clearly defined, of a fiery-red. Flowers scarlet.

168. *Queen of Spain*. Plant of fine free habit; somewhat narrow golden margin, with very distinct and clear fiery-red zone.

169. *Beautiful for Ever* (E. G. Henderson & Son). This is very similar to *Queen of Spain*, but with a clearer and more distinct zone. Previously certificated.

170. *Princess Louise.* Similar to *Queen of Spain.*

XX. PLAIN GOLDEN VARIEGATED.

171. *Golden Superb Nosegay* (Sampson). Plant of fine dwarf habit; foliage bright yellow, with very pale zone; flowers large; nosegay section; very freely produced; purplish-crimson. A splendid variety. Previously certificated.
172. *Glory of Ockenden*. Plant of very dwarf bushy habit; leaves yellow with narrow faint zone; free flowering; flowers of medium size, pale scarlet.
173. *Robert Fish* (Wills). Plant of remarkably dwarf habit; leaves very small, bright yellow; very free flowering; flowers pale orange-scarlet. This is a very dwarf variety, and is very suitable for edgings.
174. *Golden Harry Hieover* (E. G. Henderson & Son). Plant of very dwarf spreading habit; leaves small, yellow, with a narrow distinct chocolate zone; very free flowering. An excellent variety, and very suitable for edgings. Previously certificated.
175. *Creed's Seedling* (Creed). Plant of free compact habit; leaves bright greenish-yellow; free flowering; trusses small, well displayed; flowers of good form, crimson coloured. A splendid variety. Previously certificated.
176. *Crystal Palace Gem*. Plant of fine compact growth; leaves medium sized, yellow with a dark green blotch near the base; free flowering; flowers rosy-pink. One of the best bedders. Previously certificated.
177. *Golden Queen*. Plant of dwarf-spreading habit; leaves of medium size; greenish-yellow; shy flowering; flowers rosy-pink.
178. *Golden Brilliantissima* (Park). Plant of very dwarf compact habit; leaves of medium size, distinctly blotched with yellow and white round the margin; free flowering; flowers bright scarlet. Suitable for edgings.
179. *Golden Harkaway*. This is an inferior variety.

XXI. SILVER TRICOLORS.

180. *Lass O'Gowrie* (Grieve). Plant of good compact habit; margin of leaves white, with a distinct bronzy-red narrow zone. A good variety. Previously certificated.
181. *Italia Unita* (E. G. Henderson & Son). Plant of medium vigorous growth; leaves creamy-white, with distinct rosy-pink zone; flowers scarlet. Previously certificated.

182. *Glen Eyre Beauty* (E. G. Henderson & Son). Plant of vigorous growth; leaves somewhat crumpled, with creamy-white margin and distinct broad red zone; flowers scarlet. Previously certificated.
183. *Princess Beatrice* (Chater). Plant of free vigorous growth; leaves large, with narrow bright zone. Good.
184. *Prince Silverwings* (Paul). Plant of moderately vigorous habit; leaves medium sized, with a straw-yellow margin, and distinct rosy-red zone; flowers scarlet. This is a very distinct variety.
185. *Mrs. J. Clutton*. Leaves green, crimson zone, margin white; clear and distinct.
186. *Fair Rosamond*.
187. *The Graphic*.
188. *Sabella*.
189. *Knight of the Garter*.
190. *Sunny Smile*.
- } Inferior to those described.

XXII. SILVER VARIEGATED.

1. Margins pure white.

191. *Little Trot* (Davis). Plant of very fine dwarf habit; leaves large, with a broad distinct margin of pure white; flowers scarlet. This is the most distinct of any of the type, and is altogether a splendid variety. Previously certificated.
192. *Albion's Cliffs* (Chater). Plant of remarkably strong vigorous growth; leaves large, with pure white margin; flowers light scarlet. This is the strongest growing variety. Previously certificated.
193. *Princess Alexandra* (G. Smith). Plant of fine dwarf compact habit; leaves large, with pure white margin; flowers scarlet. Previously certificated.
194. *Miss Kingsbury*. Plant of strong vigorous habit; leaves broadly margined with pure white; flowers scarlet. This is, perhaps, the best white variegated variety for general bedding purposes.

2. Margins creamy-white.

195. *Flower of Spring* (Turner). Plant of free compact growth; leaves medium sized, with broad creamy-white margin; flowers rosy-scarlet. Previously certificated.
196. *Snowdrop* (Carter & Co.). Plant of moderately vigorous growth; leaves of medium size, creamy-white margin; flowers bright scarlet. Previously certificated.

197. *Brilliant Superb* (Parsons). Plant of moderately vigorous habit; leaves of medium size, very much crumpled, with narrow creamy-white margin; flowers scarlet. Previously certificated.
198. *Shottesham Pet.* Tall erect growing variety. Now superseded.
199. *Silver Chain* (E. G. Henderson). Plant of fine dwarf habit; leaves large, very slightly zoned, broad creamy-white margin; flowers scarlet. An excellent variety. Previously certificated.
200. *Laura* (Pearson). Fine habit, similar to *Silver Chain*; flowers cerise and very pleasing.

XXIII. BRONZE-LEAVED VARIETIES.

1. Flowers Salmon.

201. *The Czar* *** (J. Laing). Plant of erect vigorous growth; leaves large, with a very distinct, almost black zone, and narrow yellow margin; flowers pale salmon. This is by far the darkest bronze of any.
202. *Black Douglas* (Downie & Co.). Plant of very fine dwarf habit; fine dark broad zone, with narrow yellow margin; free flowering; pale salmon. A splendid variety. Previously certificated.
203. *Emperor of Brazil* (Downie & Co.). Very similar to *Black Douglas*. Previously certificated.
204. *Cedo Nulli* (E. G. Henderson & Son). Plant of strong robust growth; broad bright zone; flowers pale salmon, with bright eye.
205. *Free-light* (E. G. Henderson).
 206. *Marquis of Lorne* (J. Hodgson). } Inferior to those described.

2. Flowers Scarlet.

207. *Marechal MacMahon* (Downie & Co.). Plant of very robust and compact habit; leaves large and flat, with a very dark broad even zone; flowers scarlet. Still one of the best. Previously certificated.
208. *Beauty of Calderdale* (Wills). Plant of strong growing spreading habit; distinct broad zone; flowers pale scarlet. Previously certificated.
209. *James Richards* (R. H. S.). Plant of vigorous growth; leaves of medium size, with dark zone; flowers bright scarlet. Very freely produced. An improvement on *Beauty of Calderdale*. Previously certificated.

210. *King of Bronzes* (Osborn). Plant of good compact habit; leaves of medium size, with very bright uneven zone; flowers pale scarlet.
211. *Rev. C. P. Peach* (Downie & Co.). Plant of robust compact growth; foliage large, bright, with a broad dark zone; flowers pale scarlet. A good variety. Previously certificated.
212. *Reine Victoria* (Downie & Co.). Plant of free growth; leaves very large, yellow ground, with bright broad zone; flowers scarlet. Previously certificated.
213. *W. E. Gumbleton* (Downie & Co.). Plant of fine dwarf spreading habit; leaves small; very narrow yellowish-green margin and broad well-defined chocolate zone; flowers scarlet. An excellent variety. Previously certificated.
214. *Black Prince* (Downie & Co.). Plant of very free vigorous growth; leaves large, with bright distinct zone; flowers scarlet. Previously certificated.
215. *Golden Button* (E. G. Henderson & Son). Very similar to *Black Prince*.
216. *William Webb* (J. King).
217. *Crown Prince* (G. Acton).
218. *Gilt with Gold* (E. G. Henderson).
219. *Mrs. Pollard* (J. Laing).
220. *Robert Burns* (Methven & Sons).
221. *Mrs. H. Weir* (Downie & Co.).
222. *Mrs. J. Lee*.
223. *Napoleon III*.
224. *Princess of Wales* (E. G. Henderson & Son).

} Inferior to
those de-
scribed.

A SELECT LIST OF THE BEST VARIETIES IN EACH CLASS.

The numbers refer to those on the report.

I. *Flowers Scarlet, Nosegay Section.*

- | | | |
|-------------------|--|-------------------------|
| 2. Wellington. | \| | 18. Duke of Devonshire. |
| 3. H. M. Stanley. | \| | 19. Waltham Seedling. |

II. *Flowers Pale Orange-Scarlet.*

- | | | |
|---------------------------|--|---------------------|
| 23. Triomphe de Stella. | \| | 25. Grand Duke. |
| 24. Golden Harry Hieover. | \| | 31. Mrs. J. George. |

III. *Flowers Lake-Rose.*

- | | | |
|-----------------------|--|--------------------------|
| 32. Arthur Pearson. | \| | 34. Violet Hill Nosegay. |
| 33. Lawrence Heywood. | \| |  |

IV. *Flowers Scarlet shaded with Magenta.*

- | | | |
|-------------|--|----------------|
| 36. Caxton. | \| | 41. A. Rivers. |
| 39. Argus. | \| |  |

V. *Flowers Scarlet, Leaves Zonate.*

- | | | |
|---------------------|--|------------------|
| 44. Vesuvius. | \| | 53. John Watson. |
| 43. Mark Twain. | \| | 55. Wonderful. |
| 49. Rose of Summer. | \| | 56. Aurora. |

VI. *Flowers Scarlet with White Eye.*

- | | | |
|-------------------|--|-------------------|
| 57. A. F. Barron. | \| | 60. Richard Dean. |
| 58. Harry King. | \| | 66. Theocritus. |

VII. *Flowers Scarlet, Leaves Plain Green.*

75. Duke of Sutherland.

VIII. *Flowers Pale Scarlet.*

- | | | |
|---------------|--|------------------|
| 78. Red King. | \| | 79. Col. Wright. |
|---------------|--|------------------|

IX. *Flowers Crimson-Scarlet.*

- | | | |
|-------------------|--|----------------------|
| 80. Mrs. Vincent. | \| | 81. Rev. F. F. Fenn. |
|-------------------|--|----------------------|

X. *Flowers Cerise and Rose.*

- | | | |
|------------------------|--|---------------------------|
| 82. Lucius. | \| | 92. Claude de la Meurthe. |
| 83. Princess of Wales. | \| | 93. Ianthe. |

XI. *Flowers Pale Pink.*

97. Christine.

XII. *Flowers Rose-Pink, Leaves Plain.*

- | | | |
|--------------------------|--|-----------------|
| 101. Mrs. Augusta Miles. | \| | 109. Cleopatra. |
| 105. Mrs. Halliburton. | \| |  |

XIII. *Flowers Rose-Pink, Leaves Zonate.*

111. Rose of Allandale.

XIV. *Flowers Pink shaded with Purple.*

- | | | |
|-------------------|--|----------------|
| 116. Mrs. Turner. | \| | 118. Amaranth. |
|-------------------|--|----------------|

XVI. *Flowers Salmon.*

124. Vanessa.

XVII. *Flowers Oculate.*

- | | | |
|----------------|--|----------------------|
| 131. Lucretia. | \| | 132. Eugénie Mézard. |
|----------------|--|----------------------|

XVIII. *Flowers White.*

137. Snowdon.

XIX. *Golden Tricolors.*

- | | | |
|------------------------------|--|--------------------------|
| 142. Mrs. Pollock. | \| | 157. Bright Eyes. |
| 144. Countess of Ashburnham. | \| | 160. Macbeth. |
| 145. Fair Emily. | \| | 162. Home Influence. |
| 152. Lady Cullum. | \| | 169. Beautiful for Ever. |

XX. *Plain Golden Variegated.*

- | | | |
|-----------------------------|--|--------------------------|
| 171. Golden Superb Nosegay. | \| | 175. Creed's Seedling. |
| 173. Robert Fish. | \| | 176. Crystal Palace Gem. |
| 174. Golden Harry Hieover. | \| |  |

XXI. *Silver Tricolors.*

- | | | |
|------------------------|--|--------------------------|
| 180. Lass O'Gowrie. | \| | 184. Prince Silverwings. |
| 182. Glen Eyre Beauty. | \| |  |

XXII. *Silver Variegated.*

191. Little Trot.	193. Princess Alexandra.
192. Albion's Cliffs.	199. Silver Chain.
194. Miss Kingsbury.	

XXIII. *Bronzes.*

201. The Czar.	209. James Richards.
202. Black Douglas.	213. W. E. Gumbleton.
207. Marechal MacMahon.	

III. On the Best Means of preserving from extirpation some of the Aboriginal Plants of St. Helena. By T. VERNON WOLLASTON, F.L.S.

CONSIDERING the extreme interest of the various arborescent *Compositæ*, peculiar to St. Helena, and the rapid rate at which many of them are becoming extinct, it seems to me a great pity that measures should not be taken to preserve, at any rate, a few of each species before it is too late. The difficulty of getting their seeds to germinate, even after a three-weeks' passage to England, and although transmitted perfectly fresh and in the best condition, is well known to everybody who has endeavoured to introduce them into our northern greenhouses; and yet, *in situ*, every seed that is carried by the wind and lodged within a crevice or on the face of an almost perpendicular rock well-nigh denuded of soil, would seem to become a plant in an incredibly short time; and were the island but left alone (a "consummation devoutly to be wished") for a couple of generations, and the inhabitants prevented from tampering with the small remaining portion of their aboriginal forests, the whole of the central region would be again a jungle of Cabbage-trees, Gumwoods, and Asters. But each year sees the latter more and more cleared away; and what with the ruthless axe of (so-called) "civilisation" and the eternal nibbling of goats, some of the most remarkable members of the flora, such as the "Redwood" and native "Ebony" (which, however, are *not* Composites), have already disappeared for ever.

That the seeds, however, may occasionally be made to germinate even in England is certain, for at any rate two of the species which I transmitted to Sir J. Hooker, about a year and a half ago, from St. Helena, he informs me have been reared at Kew. These are the *Commidendron robustum*, DC., or "Gumwood," and the exceedingly rare *Aster gummiferus*, Hk. fil., or "Little Bastard

Gumwood.”* But that the difficulty of treating them successfully is not overrated will be readily allowed, when I mentioned that I carried a profusion of these seeds with me to Madeira, only a short time after they were gathered; and yet, with all the advantages of one of the finest climates in the world (and that too an *insular* one), and despite every possible attention, my friend Dr. Graham, whose success in cultivating shrubs from many quarters of the globe stands unrivalled, was quite unable to make a single one of them germinate.

My own belief is, that the most successful way of transporting these curious arborescent Composites will be found to be by striking healthy cuttings of them on the spot, and sending them, properly packed, in the *same* pots or boxes in which they have taken root. The young *self-sown* plants will scarcely bear to be potted-off even at St. Helena, and would probably perish the very first day at sea. But cuttings made from the fresh wood strike readily, and become vigorous plants in the course of a few months. I made the experiment of this myself, and had about fifteen of the most robust little plants, well-rooted in a box, destined for Kew; but an unfortunate *douche* of sea water as we landed on the beach at Funchal killed every one of them in less than twenty-four hours. This is much to be regretted, for half of them belonged to the all-but extinct *Aster Burchellii*, Hk. fil., of which there are only a *very* few trees now remaining (Mr. Melliss says only “one,” but I think we demonstrated that there are certainly more than that); and the other half to the less (though also extremely) rare *Aster gummi-ferus*, or “Little Bastard Gumwood,” once abundant.

I would, therefore, recommend anybody who may happen to have a sufficient length of time and leisure, at St. Helena, to devote to that purpose, to try the experiment of growing healthy cuttings from the *young* wood, and of sending them to England after they have been properly rooted and established, taking every precaution against sea-water and spray on the homeward route. But here lies one of the greatest difficulties, for I should very much doubt their being able to endure the close atmosphere of a Wardian case. Of one of the most anomalous of these arborescent *Compositæ*, namely, the *Psiadia rotundifolia* (well-figured in Mr. Melliss’ late book on St.

* There are in all now growing at Kew five species reared from seeds sent by Mr. Wollaston, viz., two plants of *Commidendron robustum*, DC. (not too robust), two of an *Aster* named *A. rugosum*, DC. (in excellent health), three of a *Sium*, two of a *Sonchus*, and one or two of a *Phyllis*.—A. M.

Helena), there is said to be but *a single* tree now left, and that one at Longwood; therefore if this species be allowed to die out, it will be another link lost and for ever from the *Systema Naturæ*.

T. V. WOLLASTON.

[*Note*.—It is unnecessary to add a word to stimulate the wish that every one must feel to do something to preserve these most interesting plants from extinction.

Two things seem possible and fitting for the Fellows of the Royal Horticultural Society to do. One, as a body, to address Government, praying them to take steps to prevent the further wanton destruction of the Aboriginal Floras, not only of this, but also of other islands which are British Dependencies, and are in a similar position, such as the Mauritius and Seychellus; the other, as individuals, to avail themselves of the services of their friends who may be passing and stopping at St. Helena for a longer or shorter time. If their friends would exert themselves after the manner pointed out by Mr. Wollaston, to bring home seeds, plants, or cuttings, they might do much; and those who feel disposed to try, need have no difficulty in getting guides, philosophers, and friends in the island to point out where the plants are to be had, &c., for the predilections of those who occupy themselves with such studies soon become known all over the island, and naturalists are always glad to help one another.—A. M.]

IV. REPORT on Violas Grown for Trial at the Society's Gardens, Chiswick, during the seasons 1876 and 1877.

*** Denotes those varieties having received First-class Certificates.

I. FLOWERS YELLOW.

1. *Bedfont Yellow* (Dean). Has degenerated very much. For description see Report of 1875.
2. *Cliveden Yellow*. Plant of somewhat spreading loose habit; free flowering; flowers rich golden yellow.
3. *Countess* (Gray). Plant of dwarf-spreading habit; free

- flowering; flowers large, sulphur yellow, with eye faintly pencilled. Stands the dry weather well.
4. *Corisande**** (Dean). Plant of very free vigorous growth; free flowering; flowers of fair size, pale yellow. A very early flowering variety continuing in bloom for several months. Excellent.
 5. *Crown Jewel**** (Dean). Plant of free-spreading habit; free flowering; flowers of medium size, of fine round form, clear bright yellow. A good variety.
 6. *Grievei* (Dickson & Co.). Plant of free-spreading habit; free flowering; flowers of fair size, pale yellow. Stands the drought well.
 7. *Golden Gem* (Dickson & Co.). See Report of 1875.
 8. *Golden Prince**** (Fromow, 1877). Plant of fine free habit; free flowering; flowers of medium size, bright yellow, with eye pencilled. Stands the dry weather well.
 9. *Lutea Grandiflora*. A very early flowering variety, and continues for a long time in bloom.
 10. *Primrose Queen* (Dean). Plant of fine dwarf-spreading habit; moderately free flowering; flowers large, clear pale yellow.
 11. *Pride of Rufford* (Dean). Plant of fine dwarf compact growth; free flowering; flowers of medium size, bright yellow, with large dark eye.
 12. *Sovereign* (Dickson & Co.). See Report of 1875.
 13. *Stricta Aurea* (Dickson & Co.). Plant of fine dwarf compact habit; very free flowering; flowers small, pure bright golden yellow. A promising and distinct variety.
 14. *The Primrose* (Dickson & Co.). Similar to *Corisande*.

II. FLOWERS WHITE.

15. *Boule de Neige* (Fromow). Plant of dwarf habit; flowers of fair size; free flowering; white, and faintly streaked towards the eye, which is yellow.
16. *Bridal Wreath* (Dean). Plant of fine compact growth; free flowering; flowers white with yellow eye, the petals faintly streaked. Very useful white variety for early flowering.
17. *Miss Maitland* (Milligan & Kerr). See Report of 1875.
18. *Miss Sutherland* (Cocker & Son). Similar to *Miss Maitland*.

19. *Vestal**** (Dean, 1877). Plant of fine compact habit; very free flowering; flowers of medium size, pure white, excellent.
20. *Chiswick White* (R.H.S.). Plant of compact growth; free flowering; flowers large white, but liable to change colour in some seasons.
21. *Delicata* (Dean). Plant of somewhat loose habit; shy flowering; flowers of medium size, white, apt to change colour. Does not stand the drought well.
22. *Ella Sheppard* (W. Kerr). Plant of medium growth; free flowering; flowers white, mottled with pale blue.
23. *Lady Susan Grant Suttie**** (Stuart). Plant of fine compact habit; free flowering; flowers large, well displayed, and of good form, of a bluish white. A good variety.
24. *Lillywhite Tom Thumb* (Dean). See Report of 1875.
25. *Miss Annie* (Cocker & Son). An inferior variety.
26. *Pilrig Park**** (Dickson & Co.). Plant of vigorous branching habit; very free and continuous flowering; blooms well displayed, very large, pure white, with yellow eye.
27. *Queen* (Dickson & Co.). See Report of 1875.
28. *Snowflake* (Dickson & Co.). See Report of 1875.
29. *Snowflake* (Dean). Plant of loose growth; free blooming; flowers white with yellow eye, marked by a few faint lines along the petals. Does not stand the dry weather well.
30. *White Swan* (Dean). See Report of 1875.
31. *White Bedder* (Dickson & Co.). Plant of compact growth; free blooming; flowers well displayed, creamy-white, with distinct yellow eye. Good for bedding purposes.
32. *White Perfection* (Dickson & Co.). An inferior variety.
33. *White Swan* (Dean). See Report of 1875.

III. FLOWERS LILAC.

34. *Azurea* (Stuart). Plant of somewhat loose growing habit; free flowering; flowers of fair size, of a pale lilac colour. Does not stand the heat well.
35. *Amabilis* (Dickson & Co.). Plant of free vigorous growth; a very free and continuous bloomer; flowers large, of fine form, and well displayed lilac with distinct blotch on under petals. A good variety.
36. *Lilacina* (Dean). See Report of 1875.

37. *Multiflora* (Dickson & Co.). Plant of fine free habit ; very free flowering ; flowers large, well displayed, pale lilac or lavender, with yellow eye and distinct bronzy spot on under petals. A very showy and effective variety.
38. *Ormiston* *** (Stuart). Plant of fine habit ; free blooming ; flowers large, well thrown above the foliage, dark lilac striped with purple. A very showy variety.
39. *Princess of Teck* (Dickson & Co.). See Report of 1875.
40. *Peach Blossom* (Dickson & Co.). See Report of 1875.
41. *Queen of Lilacs* (Dickson & Co.). See Report of 1875.
42. *Rubra Lilacina* *** (Dickson & Co.). Plant of free dwarf habit ; a profuse and continuous bloomer ; flowers large and of good substance ; rich lilac, with distinct blotch on under petals. Stands dry weather well. An excellent sort.
43. *Rosalind* (Stuart). Plant of dwarf-spreading habit ; very free flowering ; flowers large, well thrown above the foliage, rosy-lilac. A promising variety.
44. *Spring Flower* (Stuart). Very similar to *Rosalind*, but of taller growth.

IV. FLOWERS MAUVE-PURPLE.

45. *Blue Bedder* (Dean). Plant of dwarf-spreading habit ; free flowering ; flowers purplish-mauve, with yellow eye. Does not stand the drought well.
46. *Blue Bell* *** (Dean). See Report of 1875.
47. *Blue Gem Tom Thumb* (Dean). Plant of free growth ; free flowering ; blooms small, light mauve-purple, with pencilled eye.
48. *Cliveden Purple*. Very similar to *Blue Bedder*.
49. *Cliveden Blue*. Inferior.
50. *Concord* (Cocker & Son). A very inferior variety.
51. *Dr. Stuart* (Stuart). See Report of 1875.
52. *Hillside Beauty* *** (Stuart). Plant of fine vigorous growth ; very free flowering ; flowers large, of a dark mauve-purple colour. An excellent variety, and stands the dry weather well.
53. *King* (Dickson & Co.). Plant of free-growing, somewhat tall habit ; free flowering ; flowers dark mauve. Does not stand the drought well.

54. *Profusa* (Cocker & Son). An inferior variety.
55. *Williams* (Stuart). See Report of 1875.
56. *Amæna Magnifica* *** (Dickson & Co.). Dwarf-spreading habit; free flowering; flowers small; mauve, with distinct yellow eye, and upper petals dark. A good variety.
57. *Blue Perfection* (Westland). See Report of 1875.
58. *Purple Perfection* (Westland). Same as *Blue Perfection*.
59. *Magnificent* (Dean). Flowers rather darker than *Purple Perfection*, but similar in habit of growth, &c.
60. *Blue Beard* (Dean). Plant of fine dense compact growth; free flowering; flowers large; well displayed, dark blue, with yellow eye, and distinct bronzy spot on under petals. Good in dry seasons.
61. *Blue Jacket* (Dean). Of looser habit than *Blue Beard*, but in other respects similar.
62. *Blue King* *** (Dean). Plant of fine dwarf compact habit; free flowering; blooms well displayed, lightish blue, with distinct bronzy spot on under petals.
63. *Lottie* (Gray). Plant of dwarf-spreading habit; free flowering; flowers bright blue. Stands the weather well.
64. *Major* (Cocker & Son). Plant of dwarf-spreading habit; free flowering; flowers lightish blue, with distinct blotch on under petals.
65. *Nickie* (Cocker & Son). Resembling *Blue King*.
66. *Royal Blue* (Dean). See Report of 1875.
67. *Royal Blue* (Paul). Same as *Blue King*.

V. FLOWERS PURPLE OR BLUE.

68. *Alpha* (Dickson & Co.). See Report of 1875.
69. *Blue Gown* (Stuart). Plant of vigorous and somewhat tall growth; free blooming; flowers rich purple. A showy variety.
70. *Chieftain* (Dickson & Co.). Plant of fine dwarf habit; free and continuous blooming; flowers large; dark purple, with tips of upper petals almost black. Second-class Certificate in 1874.
71. *Duke of Edinburgh* (Dickson & Co.). Plant of fine dwarf-spreading habit; free flowering; flowers rich purple, with yellow eye. A good variety in dry seasons.

72. *Georgia**** (Stuart). Plant of very fine dwarf compact habit ; very free and continuous flowering ; flowers well displayed, of a purple hue. A good variety and lasting.
73. *Holyrood**** (Dickson & Co.). Plant of dwarf-branching habit ; very free and continuous blooming flowers ; large rich deep purple, with small yellow eye, and distinct blotch. Stands the dry weather well. 1877.
74. *Sunny Park Rival* (Cocker & Son). Plant of dwarf-spreading habit ; free flowering ; flowers very large, dark purple, with very distinct black blotch on under petal. A promising variety.
75. *In Memoriam* (Dickson & Co.). Plant of fine dwarf-spreading habit ; free and continuous blooming ; flowers rich dark purple, with distinct yellow eye, and dark blotch on under petals.
76. *Lothair* (Dean). See Report of 1875.
77. *Mulberry* (Dean). See Report of 187
78. *Maggie* (Dean). See Report of 1875.
79. *Mutilata* (Dickson & Co.). Plant of fine compact habit ; free and continuous blooming ; flowers large ; purple, with bright yellow eye, and dark blotch on under petals. Stands the drought well. A good variety.
80. *Mazarin Gem* (Cocker & Son). Plant of free-growing spreading habit ; free flowering ; flowers of medium size, bluish-purple, with very large yellow eye.
81. *Novelty* (Cocker & Son). See Report of 1875.
82. *Nina* (Stuart). Similar to *Blue Gown*, but having rather larger flowers.
83. *Othello* (Dean). Plant of vigorous and somewhat tall habit ; free blooming ; flowers very dark purple, with distinct yellow eye. Does not stand the dry weather well.
84. *Purple King* (Stuart). Plant of loose habit ; moderately free flowering ; flowers dark purple.
85. *Sutton Court Beauty**** (Fromow). Plant of fine dwarf-spreading habit ; very free and continuous blooming ; flowers large, of a fine rich purple colour. A splendid variety.
86. *Tyrian Prince* (Dean). See Report of 1875.
87. *The Tory* (Dickson & Co.). See Report of 1875.
88. *Vanguard* (Dickson & Co.). Plant of vigorous habit ; moderately free flowering ; flowers large, dark purple, with distinct

yellow eye. An early flowering variety, but inferior in dry seasons.

89. *Waverley* *** (Robertson and Galloway). Plant of free-growing spreading habit; very free and continuous blooming; flowers large, [bluish-purple, with large yellow eye, and distinct blotch on the under petals. A splendid variety.

VI. FLOWERS DARK VIOLET.

90. *Distinction* (Gray). Plant of somewhat loose straggling habit; moderately free flowering; flowers large, of a dark violet. Stands well in a dry season.
91. *Giant* (Stuart). Plant of very loose growth; moderately free flowering; flowers large, dark, streaked. Violet.
92. *Lady Sophia* (Gray). Very similar to *Distinction*.
93. *Lady Diana* *** (Gray). This is very similar to *Distinction* and *Lady Sophia*, but is of more compact growth, and consequently was awarded the Certificate.
94. *Montgomeriana* (Gray). Bears a great resemblance to *Lady Sophia*.
95. *Mulberry King* (Fromow). Larger flower than *Distinction*, but in other respects very similar.
96. *The Shah* (Cocker & Son). Plant of somewhat loose habit; free flowering; flowers large, of a rich dark violet.
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V. REPORT ON Annuals grown at Chiswick, 1877.

I. CLARKIA.

Clarkia pulchella. California; stem branching at the base; height 18 to 20 inches; leaves lanceolate; flowers large and showy, produced from the axils, of a light rose or purple colour, calyx reflexed, corolla of 4 petals, in the form of a cross, the limbs deeply three-lobed. It is a somewhat variable plant, the numerous

varieties in cultivation differing from each other in the size, form, or colouring of the flowers, or habit of the plant.

All the varieties of *Clarkia* are extremely elegant and showy annuals of very easy culture.

1. *Clarkia pulchella* (Vilmorin et Cie.). Height 15 to 18 inches; flowers rosy-magenta. A good selection.

2. *C. pulchella nana* "Tom Thumb" (Vilmorin et Cie.). Height 7 inches; very dwarf compact form of the preceding, and well adapted for bedding. An excellent stock.

3. *C. pulchella alba* (Vilmorin et Cie.). Height 15 to 18 inches; a well-selected, white-flowered form of *C. pulchella*.

4. *C. pulchella alba nana* (Vilmorin et Cie.). Height 9 inches dwarf compact form of the preceding. A good strain.

5. *C. pulchella* (Vilmorin et Cie.). A well-selected semi-double form of *C. pulchella*; the flowers large and showy, and last longer than the single variety.

6. *C. pulchella marginata* (Vilmorin et Cie.). Height 18 inches; flowers large, the petals margined with white, giving it a very showy appearance.

7. *C. pulchella marginata* (Vilmorin et Cie.). Semi-double form of the preceding.

8. *C. pulchella integripetala* (Vilmorin et Cie.). Height 12 to 15 inches. The flowers of this variety are large and very showy, the petals broad, almost entire, i.e., not lobed as in the type. A fine selection.

9. *C. pulchella integripetala white* (Vilmorin et Cie.). A white-flowered form of *C. pulchella integripetala*; very showy. A good selection.

10. *C. pulchella pulcherrima* (Vilmorin et Cie.). Flowers large, beautiful clear rose, shaded with magenta, the petals deeply lobed; very distinct and pretty. A fine selection.

11. *C. elegans*. California; stem branching, the branches growing erect or pyramidal, and flowering from the base upwards in the form of a spike, from 2 to 2½ feet high; leaves of medium size, ovate, of a glaucous green colour; flowers from 1 to 1½ inches in diameter, the petals rounded, those of the typical form rather narrow, of a dull salmony colour. The pyramidal habit of *C. elegans* gives it a very distinct appearance from *C. pulchella*.

12. *C. elegans rosea* (Benary). Height 24 inches; flowers of medium size; salmon colour. Inferior.

13. *C. elegans rosea fl. pleno* (Benary). A semi-double flowering form of the preceding. Good strain.

14. *C. elegans rosea flore pleno vel neriiflora* (Benary). This is a fine selection from the foregoing; the flowers large, showy, and well displayed, rosy-salmon with brighter streaks along the centre of each petal. Very pretty and effective.

15. *C. elegans* "*Salmon Queen*" (Hardy). Height 30 inches; very free flowering; flowers very large, in some cases $1\frac{1}{2}$ inches in diameter, of a distinct salmony-pink colour. This is a very fine selected stock of the preceding and distinct. Previously certificated.

16. *C. elegans alba plena* (Vilmorin et Cie.). A semi-double white-flowered variety; flowers small and inferior.

17. *C. elegans* "*Purple King*" (Hardy). Very free flowering; flowers very large and double, dark mauve. Very fine selected stock. Previously certificated.

18. *C. elegans, double purple* (Benary). An inferior strain of the preceding.

19. *C. elegans rosea alba* (Vilmorin et Cie.). 24 inches high; flowers semi-double, white tinged with rose. A very novel, pretty, and distinct variety.

II. IBERIS OR CANDYTUFT.

1. *Iberis amara* (Vilmorin et Cie.). Stem erect, from 12 to 15 inches high, branching, the branches growing close, and forming, when in flower, a sort of large corymb; leaves small, a little toothed. The flowers are borne on the summit of the branches, and are at first umbellate, becoming more elongated as they grow; small, white.

2. *I. amara hesperidifolia* (Vilmorin et Cie.). A dwarf-growing form of *Iberis amara* with fully larger and finer flowers.

3. *I. lagascana* (Vilmorin et Cie.). Similar to *I. amara hesperidifolia*.

4. *I. amara* "*Tom Thumb*" (Vilmorin et Cie.). A very dwarf form of *I. amara*; height 3 to 4 inches. Excellent for small beds.

5. *I. affinis* (Vilmorin et Cie.). A dwarf form of *I. amara*, but of more spreading habit.

6. *I. odorata* or *pinnata* (Vilmorin et Cie.). Height 12 inches. This resembles *I. amara*, but with larger flowers, and which are sweet-scented. It also flowers several days earlier than any other variety.

7. *I. umbellata* (syns. *Iberis corymbosa*, *I. coronata*) (Vilmorin et Cie.). Height 12 inches; flowers lilac or pale purple. This plant is of the same form as *I. amara*, but with far larger and more beautiful heads of flower.

8. *I. umbellata lilacina* (Vilmorin et Cie.). Height 12 to 15 inches; umbels large; flowers rich lilac. Beautiful and very effective. Very fine selection.

9. *I. umbellata nana lilacina* (Vilmorin et Cie.). Height 9 inches. A compact dwarf-growing form of the preceding.

10. *I. umbellata flore violaceo* (Vilmorin et Cie.). Height 12 inches; umbels large; flowers rich purple.

11. *I. umbellata atropurpurea* (Vilmorin et Cie.). Like the preceding in colour of flower, but of somewhat dwarfer habit. A very fine selection.

12. *I. umbellata hybrida nana rosea* *** (Vilmorin et Cie.). Height 9 inches; umbels very large and flat; petals broad; white tinged with rosy-pink. A novel and very effective variety.

13. *I. umbellata carnea* (Vilmorin et Cie.). Height 12 inches; umbels large; flowers pale flesh colour. A good selection.

14. *I. umbellata dwarf flesh coloured* (Vilmorin et Cie.). Same as preceding, No. 13, but of rather dwarfer growth. Very good stock.

15. *I. umbellata hybrida nana alba* *** (Vilmorin et Cie.). Height 9 inches; umbels large, the petals broad; pure white. A very showy, distinct, and splendid variety.

Those marked thus *** have been awarded First-class Certificates.

III. VISCARIA OR LYCHNIS.

1. *Viscaria cardinalis* (Haage & Schmidt). Stems much branched from the base, spreading; height 15 to 18 inches, forming very floriferous tufts; flowers deep rosy-magenta; very showy and splendid. An excellent stock.

2. *V. cardinalis* (Benary). Very much mixed with *V. splendens*.

3. *V. oculata rosea* (Vilmorin et Cie.). Height 18 inches, spreading; flowers pale rosy-lilac.

4. *V. hybrida splendens* (Vilmorin et Cie.). Same as *V. oculata rosea*.

5. *V. oculata nana rosea* (Vilmorin et Cie.). Height 9 inches. A dwarf compact-growing form of *V. oculata rosea*.

6. *V. oculata cœrulea* (Vilmorin et Cie.). Height 15 to 18 inches; flowers pale blue. Very fine stock.

7. *V. oculata alba* (Vilmorin et Cie.). Height 18 inches; flowers creamy-white, the petals deeply notched. A good selection.

8. *V. oculata pure white dwarf* (Vilmorin et Cie.). Height 9 inches; of very close and compact growth.

9. *V. oculata nana carnea* (Vilmorin et Cie.). Height 10 inches; flowers very pale pink shaded with lilac. Inferior.

10. *V. Dunnetti* (Vilmorin et Cie.). Height 9 $\frac{1}{2}$ inches, of very close compact growth; flowers very pale lilac. Distinct and pretty.

11. *V. elegans picta* (Vilmorin et Cie.). Height 15 to 18 inches; of spreading habit; flowers pale with deep rosy disc. A good strain.

12. *V. elegans picta striata* (Vilmorin et Cie.). A variety of *V. elegans picta*, with band of deep rose along the centre of each petal. Very singular and distinct.

IV. GODETIA.

1. *Godetia rubicunda* (Vilmorin et Cie.). California Plant pubescent, branching from the base; branches spreading, then erect from 18 inches to 2 feet high; leaves lanceolate, of a dull green colour; flowers produced in form of a spike, large, cup-shaped; petals 4 in number, $1\frac{1}{2}$ inches long, the upper parts pale red, the base rose coloured. Showy when in full flower on bright days.

2. *G. Lindleyana* (Benary). Same as *G. rubicunda* (Vilmorin et Cie.).

3. *G. rubicunda splendens* (Vilmorin et Cie.). Same as *G. rubicunda*, with a deeper blotch of rose on the petals.

4. *G. rubicunda flore pleno* (Vilmorin et Cie.). A semi-double flowering form of *G. rubicunda*, more showy, more lasting and effective.

5. *G. Lindleyana flore pleno* (Benary). Same as *G. rubicunda flore pleno* (Vilmorin et Cie.).

6. *G. Lindleyana* "Tom Thumb" (Benary). A dwarf compact growing form of *G. Lindleyana*.

7. *G. amœna* (Benary). Same habit as *G. rubicunda*; flowers of a somewhat paler shade.

8. *G. Schammini Nivertiana* (Vilmorin et Cie.). Same habit of growth as *G. rubicunda*; flowers nearly white, the lower part of the petals of a deep rose. Very elegant.

9. *G. rosea alba* (Benary). Same as *G. Schammini Nivertiana* (Vilmorin et Cie.).

10. *G. rosea alba* "Tom Thumb." A dwarf compact growing form of *G. rosea alba*.

11. *G. amœna flore albo* (Benary). A very mixed stock.

12. *G. "The Bride"* (Dippe Bros., Benary). Flowers pale pinkish-white, with large, bright, deep, rosy blotch on base of petals.

13. *G. Schammini* (Vilmorin et Cie.). This is a pale-flowered form of *G. "The Bride,"* with a smaller blotch.

14. *G. Whitneyi* (Dippe Bros., Benary). Height 12 inches; plant of very compact bushy habit; leaves large and broad; flowers large, well displayed above the foliage, of a rosy-lilac colour, with a deep crimson blotch on base of petals. A fine showy annual.

15. *G. reptans alba* (Benary). A dwarf compact growing form of *G. Whitneyi*.

16. *G. "Lady Albemarle"* (Daniels Bros.). Same habit as *G. Whitneyi*; leaves narrow; flowers large, deep crimson-magenta, extremely showy and attractive. Evidently a selection from *G. Whitneyi*.

17. *G. tenella* (Benary). Height 8 to 10 inches; the flower small, borne on top of spike, of a pale lilac colour, very early flowering, but otherwise worthless.

18. *G. Willdenowii* (Benary). Height 12 inches, of compact habit, and very free flowering, but not showy.

19. *G. insignis* (Benary). Same as *G. Willdenowii*.

20. *G. reptans purpurea* (Benary). Height 12 to 18 inches;

habit spreading, slender; flowers small, deep lilac with rosy blotch. Showy.

21. *G. Romanzovi* (Benary). Height 12 inches; habit erect; flowers bluish-purple. A very worthless variety.

VI. THE "Elixir," or Buffalo Horn Manure.

In April, 1876, Messrs. Taylor and Hughes, of the Anglo-French Horn Works, Grove Road, Clapham Junction, sent to the Royal Horticultural Society's Gardens, Chiswick, a small sample of manure with the following communication:—"Dear Sir,—We wish to draw your attention to this sample of pure Buffalo Horn Dust, an article which is used largely in the vineyards of France and Italy. It has also been tried here privately for this purpose, and find it is an excellent fertiliser; more particularly where mixed with other matter."

This material is simply the very fine shavings and scrapings from the manufacture of horns. It is of extremely light compo-nency, one bushel weighing about 30 lbs., and has somewhat the appearance of chopped lichen.

It was in due course tried and tested in various ways, in comparison with ordinary stable manure, guano, some patent chemical manures, &c.

1. By admixture with the soil for the potting of plants, and for planting; also as a top-dressing. 2. As a top-dressing by itself.

The subjects operated upon were vines planted out—vines in pots; Peaches and other fruit trees in pots; Fuchsias, Pelargoniums, &c.; each of these subjects being treated in a corresponding manner with the other manures. The soil used in each case was the same—a pure, sandy loam, totally devoid of organic matters, and so wretchedly poor that those plants treated without any of the manures scarcely grew at all.

The results as to growth in each example treated with this manure were eminently satisfactory, the plants soon assuming a very deep green hue of foliage, and growing most luxuriantly; more marked than in either of the others. Where used as top-

dressing, also, the roots very soon permeated through, and grew most luxuriantly.

In my opinion—after two seasons' trial of this manure—I consider it to be one of the most efficient, easy of application, sure and certain in its results.

VII. THE LATE ANDREW MURRAY, F.L.S.

DEATH has deprived the Royal Horticultural Society of one of its most accomplished and active supporters. Once Assistant-Secretary, then Member of Council, and up to the very last Scientific Director and Editor of this Journal, by the death of Mr. Andrew Murray, on the 9th January, a vacancy has been created in our ranks that will not be soon or easily filled. Those who knew him best can most readily understand how seriously he will be missed, though all who have come in contact with him will regret the absence of his kindly manner and the readiness he always exhibited to impart to others of the varied store of knowledge he had accumulated during a long and active life devoted to the pursuit of science. But it was in his capacity as a member of the Scientific Committee that he rendered so much valuable service in the interests of horticulture. Difficult questions regarding the injurious operations of insects upon vegetation were always investigated by Mr. Murray with patience and intelligence, for it was as an entomologist that he in an especial manner won his scientific reputation.

A brief sketch of his life seems appropriate in closing this number of the Journal, left unfinished by the death of its editor. He was born in Edinburgh, in the year 1812—the eldest son of William Murray, of Conland, Perthshire. From his earliest years he evinced a remarkable inclination for the study of natural history, and though he was intended to follow the legal profession, and for some time indeed he was a Writer for the “Signet,” yet his passionate love of Nature never wavered, and his anxiety to extend his knowledge led him to attend the Natural History Lectures connected with the College in Edinburgh, and thus the foundation was laid of the painstaking, patient, and exact habits of

observation which in after life contributed mainly to render him valuable as an investigator, as his great talent for drawing made him reliable as an exponent of the knowledge he had acquired.

In 1851 he published his first paper, which appeared in the Transactions of the "*Société Entomologique de France*," and since then he has constantly communicated useful papers on various subjects, entomological and botanical, to different learned societies.

In 1857 he was elected President of the Botanical Society of Edinburgh, and also of the Physical Society, and the same year he wrote several valuable papers, which were published in the Transactions of the Botanical Society, on "*Californian Trees*," on "*The Plants of Old Calabar*," on the Proceedings of the Oregon Committee, in whose operations he took a deep interest, and to whom we are indebted for the introduction of many of the noble trees now so familiar—originally natives of Western North America—amongst which may be named: *Cupressus Lawsoniana*, *Pinus Jeffreyi*, *Abies Pattoniana*, &c.

In 1861 Mr. Murray was elected Assistant Secretary to the Royal Horticultural Society, when he compiled and published an elaborate volume, entitled "*The Book of the Royal Horticultural Society*," which, by permission of Her Majesty the Queen, he dedicated to the memory of the late Prince Consort. About this time he was engaged on several botanical works, "*On the Pines and Firs of Japan*," and on the still unfinished work, "*Pinetum Britannicum*."

It was at Mr. Murray's suggestion that the Privy Council were moved to take steps for the formation of a collection illustrative of Economic Entomology, under the direction of the Science and Art Department, with a view to disseminate useful knowledge throughout the country as to the nature and habits of the insect pests which destroy or damage the crops; and Mr. Murray was entrusted with the arrangement of the collection thus initiated, which is now under exhibition at the Bethnal Green Museum, a work into which he threw the whole of his energies, sparing himself no trouble so that his work should be absolutely reliable; the integrity of his purpose being manifested in his invariable habit of recording his doubts wherever they occurred, so that there should be no possibility of a mistake happening through any shortcoming on his part. Would that all scientific investigators were equally honest!

In 1869 Mr. Murray accompanied Sir Joseph Hooker and Dr. Hogg as a delegate from the British Government to the

Botanical Congress at St. Petersburg; and in 1873 he undertook a journey to California for the purpose of scientific collection and mining investigation. During his absence he wrote many letters of a most deeply interesting nature, which it is hoped may some day be made public, affording as they do much valuable information on the botany, entomology, and geology of the districts he visited.

His last illness was short and severe; his end was most unexpected, and the sad news was received by the members of the various Committees, which met on the 15th January, with a shock of deep concern, for he had been present at the very last meeting, to all appearance well and hearty, though evidently fagged with hard work. Sir Joseph Hooker, on the part of the Scientific Committee, undertook to write a letter of condolence to the bereaved widow; and a minute expressive of their sense of the great loss they had sustained by the death of so valued and active a member was recorded. The subject was also alluded to at the Fellows' Meeting on the same afternoon, when a resolution was unanimously adopted recognising his services and marking the Society's deep sense of the loss of so esteemed a member.

VIII. REPORT on Tomatos Grown for Trial at the Society's Gardens, Chiswick, 1877. By A. F. BARRON.

OF this now extremely popular and esteemed vegetable a collection of fifty-two reputedly distinct varieties was received from Messrs. Carter, Veitch, Minier, Vilmorin (Paris), Benary (Erfurt), Bliss (New York), Earley, Vick, Wheeler.

These represented almost every name to be found in commerce, but since then others have appeared. In America, where Tomatos are most cultivated, a number of new varieties are sent out almost every year, the result being a great multiplicity of names having but slight distinctions of character. The entire collection was grown in pots under glass—two plants of each sort—and also in the open ground, trained to stakes. Those in pots ripened an excellent crop of fruit, and afforded a good opportunity of noting their characteristic merits. Those growing in the open ground, although they grew well and produced much fruit, yet—excepting for the earlier varieties—the season proved too cold to properly ripen them. This, however, proved their suitability or unsuitability for open-air cultivation.

The typical forms or varieties are described. Those given as synonyms, if not exactly so, are so very similar as scarcely to be distinguishable.

Those marked *** have received First-class Certificates.

I. FRUIT RED.

1. *Red Currant*.

Fruit small, round, bright red, of the size of red currants, borne on slender racemes from 6 to 12 inches in length. Ripens early. Plant of slender growth, profusely branching, and very productive. Leaves small, deep green. A very ornamental plant when covered with the ripe fruit, which last for a long time. They are very sweet and pleasant to the taste, but too small for any general use.

2. *Red Cherry*.

Fruit round, red, of the size of ordinary cherries, borne on short racemes very profusely. Ripens freely. Plant of free growth, branching. Leaves of small size, even, deeply toothed, of deep green

colour. A very free fruiting, ornamental sort, but the fruit are too small for ordinary use.

3. *Round Red*.

Fruit round, of somewhat larger size than the *Red Cherry*, approaching that of a fair-sized plum, borne on large clusters. Ripens freely. Plant of free growth. Leaves a little curled.

4. *Little Gem* (Bliss & Sons) ***.

Fruit similar to the *Round Red*, borne on large clusters very profusely, the later fruit larger, more flattened, and obtusely angular. Plant of dwarf but free growth, the leaves of a light green. Ripens early. A profuse bearer and first-class hardy sort.

5. *Little Gem* (Veitch).

Fruit similar to *Little Gem* of Bliss. Plant of very slender growth, leaves somewhat curled, and spare bearer, very early, ripening some four or five days before any other variety.

6. *Grape Shot* (Bliss & Sons).

Fruit small, round, of a distinct carmine-red colour. Plant of tall slender growth; the leaves very small, pale green. A very shy bearer, but very distinct.

7. *Red Plum*.

Fruit of small size, ovate-shaped, or like a small plum. Plant of free growth. A great bearer, and ripens early.

8. *General Grant* (Carter).

Fruit of medium size, round, red, smooth, the later fruits more flattened and obtusely angular. Plant of tall, vigorous growth. Leaves very dark green. A profuse and free bearer.

9. *Sim's Mammoth* (Carter).

Similar to *General Grant*.

10. *Pear Shaped.*

Fruit from 2 to 2½ inches long, in exact shape like a pear, smooth, deep red, the later fruits frequently smooth, ovate, and the general tendency being to revert to this form. Plant of free vigorous habit. A most profuse bearer, the fruit borne in clusters of seven or eight together, and hang long after being ripe. A very handsome variety for growing as an ornamental fruiting plant.

11. *Criterion* (Carter) ***.

Synonym.—New Improved (Vick).

Fruit of large size, ovate, perfectly smooth. Colour deep carmine, of excellent quality and very distinct. Plant of strong vigorous growth. Leaves slightly curled. A profuse bearing sort, the fruit borne in large clusters. Ripens early and freely. A novel and most distinct variety.

12. *Keye's Prolific.*

Fruit of medium size, flattened, and much ribbed or corrugated, of a fine red colour. Plant of moderate growth. Leaves very large, broad, flat, pale in colour, not nearly so much cut as others, very distinct. Fruit borne in very large clusters most profusely. Ripens early, and succeeds well out of doors, but is objectionable on account of the deeply ribbed fruit.

13. *Orangefield.*

Synonyms.—New Early Dwarf Red (Vilmorin et Cie.); Early Dwarf French (Veitch); Hubbard's Curled Leaf (Veitch); Early Large Red (Vilmorin et Cie.).

Fruit of medium size, sometimes large, flat, deeply-ribbed or corrugated, of a deep red colour. Plant of very free dwarf growth, seldom exceeding 12 inches. Leaves pale green, very much curled. A moderate bearer. Ripens early, and is esteemed for its dwarf habit.

14. *Conqueror* (Bliss & Sons).

Synonyms.—General Grant (Veitch) (Minier & Co.); Triumph (Bliss); Portsmouth (Vick).

Fruit above medium size, roundish, slightly ribbed or corrugated,

of a clear deep red colour. Plant of very free growth. Leaves deep green, slightly curled. A great bearer, the fruit being borne in very large clusters. Ripens freely. A very good sort.

15. *Large Red* (Vilmorin et Cie.) ***.

Fruit very large, broad, flattened, somewhat corrugated, of a bright red colour. Plant of dwarf free growth. Leaves narrow, slightly curled. A most profuse bearer, the fruit produced in very large clusters. A larger and somewhat later form of *Orangefield*. Excellent.

16. *Large Red* (Veitch) (Minier).

Synonyms.—Large Red Ribbed (Vilmorin); Large Italian Red (Veitch); New York Market (Veitch); Large Red Smooth (Carter); Belle de Leuville (Vilmorin); Arlington (Veitch); Dwarf Red (Wheeler); Crimson Cluster (Veitch); Cedar Hill (Vick); Mampuy's Superior (Carter).

Fruit of medium size, flattened and much corrugated, especially the later fruit. Plant of vigorous growth. Leaves pale green, much curled. This may be termed the ordinary form of Tomato as generally cultivated.

17. *One Hundred Days'* (Bliss & Sons).

Fruit of medium size, roundish, a good deal corrugated, of fine colour. Plants of very vigorous growth. Leaves deep green. A most abundant bearer, the fruit borne in large clusters. Very early. An excellent, hardy, vigorous sort.

18. *Hathaway's Excelsior* ***.

Synonyms.—Cook's Favourite (Bliss & Sons); Red Apple (Vilmorin); Charter Oak (Veitch).

Fruit large, round, quite smooth and even, or seldom corrugated. Plant of remarkably free growth. Leaves deeply cut, deep green in colour, and seldom curled. A free and most abundant bearer. Mid season. One of the best of Tomatos grown.

19. *Earley's Defiance* (Earley).

Very similar to *Hathaway's Excelsior*.

20. *Sims Mammoth* (Veitch).

Synonym.—Newburgh Prize (Veitch).

A large late variety of *Hathaway's*, with more corrugated fruit. Inferior.

21. *Trophy* (Veitch) (Carter) (Wheeler) ***.

Fruit very large, broad, flat, deeply ribbed or corrugated. Plant of dwarf robust growth. Leaves deeply cut, dark green. A wonderfully profuse bearer, but very late in ripening. A splendid sort for cultivation in heat, but except in warm seasons worthless in open air.

22. *Hepper's Goliath* (Veitch).

Synonym.—Hepper's Sensation (Minier & Co.).

Fruit enormously large, broad, much corrugated, and seldom ripening well. Plant of dwarf, very robust growth. Leaves light green, slightly curled. Too coarse and late for general cultivation.

23. *Rose Apple* (Vilmorin).

Synonyms.—Lester's Perfection (Veitch); Giant Rose (Veitch).

Fruit very large, broad, flat, and corrugated, of a beautiful rosy-crimson colour, very distinct. Plant of very strong growth. A shy bearer. Ripens late.

24. *New Proliferous* (Veitch).

Fruit small, irregular in size and form, much corrugated, the first fruit bearing others on their surface in a most irregular manner, hence called proliferous. Plant of very strong growth, the fruit produced in very large clusters, very distinct, but utterly worthless.

25. *Striped Tomato* (Vilmorin).

This is a variety of the ordinary form, having the fruit streaked with pale orange. Of no value.

26. *De Laye's*.

Synonyms.—Upright; or Tree Grenier.

Fruit very large, roundish, smooth, slightly corrugated at base

of a beautiful deep red colour. Plant of strong robust growth, perfectly distinct in character from any other Tomato. Leaves deep green. A very shy cropper, and very late. The fruit will ripen under glass, but in the open air they never do so. Worthless.

II. FRUIT YELLOW.

27. *Yellow Cherry*.

Similar to the *Red Cherry*, the fruit pale yellow or orange. Ornamental.

28. *Yellow Plum* (Veitch).

Similar to *Red Plum*, the fruit yellow. Ornamental.

29. *Large Yellow* (Vilmorin) (Veitch).

Fruit large, flat, much corrugated, of a dull orange-yellow colour. Plant of strong growth. Leaves curled. A shy bearer, and worthless variety.

30. *Yellow Prolific* (Bliss & Sons).

Fruit large, flat, somewhat corrugated, of a fine clear straw-yellow colour. Plant of tall vigorous growth. Leaves small, deeply cut. A free fruiting sort. Ripens early.

31. *Green Gage* (Carter & Co.) ***.

Fruit of medium size, roundish, of smooth even surface, not corrugated, of a fine clear orange-yellow colour. Plant of free growth. Leaves slightly curled. A very profuse bearer, the fruit produced freely in large clusters. Ripens early. The best yellow Tomato.

32. *Golden Trophy* (Bliss & Sons).

Synonym.—New Golden Trophy (Benary).

Fruit large, broad, flat, corrugated, the exposed portions of a reddish-orange colour, the others pale orange. Plant of tall robust growth. Leaves small, deeply cut, deep green. A spare bearer, and late in ripening. Too coarse.

Strawberry Tomato (Carter).

This is the *Physalis edulis*, or *Cape Gooseberry*, not a Tomato.

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IX. REPORT on Asters Grown for Trial at the Society's Gardens,
Chiswick, 1877. By A. F. BARRON.

SOME difficulty was experienced in obtaining a proper supply of seeds of many varieties, owing to a general failure of the crop of the previous season, so that the trial may not have been quite so satisfactory and complete as in any other season it might have been. All the varieties were sown in pots and planted out; the season being moist was propitious for their growth, and the flowers produced were in most instances of large size and fine quality.

The object aimed at in the report is to point out the characters of the various classes of Asters as now grown, whereby they may be distinguished from each other. To particularise each colour separately would extend the report to undue length and for little practical purpose, so a few only of the more prominent colours are specified. It may be noted that the tendency in most cases to multiply shades of colour seemed to promote a general inferiority; where a few bright colours only are selected and grown, the result is infinitely more pleasing and effective.

A. 1. CHRYSANTHEMUM ASTERS.

These are so named from having the flowers resembling those of the ordinary Chrysanthemum. The flowers are mostly large, often exceeding four inches in breadth. The petals broad, generally lying flat, but in the best flowers they are frequently recurved so as to raise the centre of the flowers. The plants are of compact growth, 9 to 12 inches high, slightly branching, the flowers borne erect on strong stalks.

This section is, perhaps, the most effective for bedding or general purposes.

1. *Dwarf Chrysanthemum* (Wheeler & Son). Comprising 12 colours, an especially good selection, particularly the dark blue and white. Average height 10 inches.
2. *Reine Marguerite pyramidale* (Vilmorin). Comprising 10 colours. Height 10 to 12 inches, an inferior and irregular stock.
3. *Dwarf Chrysanthemum-flowered* (Vilmorin). Flesh colour. Very poor.
4. *Dwarf Chrysanthemum* (Dippe Bros.). Fiery scarlet and

coppery scarlet, very bright and novel colours. Plants very dwarf.

5. *Chrysanthemum-flowered Dwarf* (Henderson & Son). Fiery red, the same as fiery scarlet of Dippe's. Very good.

A. 2. VICTORIA ASTERS.

This is a somewhat taller growing form of the *Chrysanthemum* section.

6. *Victoria* (Dippe Bros). Of 6 distinct colours. Very excellent.
7. *Victoria* (Haage & Schmidt). Of 12 colours. Somewhat irregular in growth.
8. *Victoria* (Carter). Of 6 colours, a very fine selection.
9. *Victoria* (Dean). Of 5 colours. Fine flowers, plants of taller growth than any of the other sorts.
- 9A. *New Dwarf German*. French vars. (Carter). Of 8 colours. A very good assortment.
10. *Rose* (Haage & Schmidt). Of 12 colours. Flowers very large and good, the colours all very distinct, plants of somewhat irregular growth.
11. *Washington* (E. G. Henderson). Of 2 colours, peach blossom and white. Flowers very large and of fine form, of robust growth. Excellent.

B. EMPEROR ASTERS.

The flowers of this section are very large, broad, and flat in general character, like the *Chrysanthemum*. The plants are very seldom branching, a single flower only being borne on the stem, which is of very robust growth.

12. *Giant* or *Emperor* (Carter & Co.). Of 6 colours. Flowers very large and fine. Plants from 16 to 18 inches high.

C. PÆONY-FLOWERED ASTERS.

The flowers of this section are large and full, the petals broad and incurving; the best flowers forming almost a round ball 3 to 4 inches in diameter. Plants of tallish growth, averaging from 18 to 24 inches, slightly branching and free flowering. The flowers erect on strong stalks.

13. *Improved Pæony Perfection* (Dippe Bros.). Of 16 distinct colours. A very excellent strain.
14. *Truffaut's Pæony-flowered Perfection* (Wheeler & Son). Of 12 colours. A very even and excellent strain.
15. *Large flowering Pæony Perfection* (Haage & Schmidt). Of 12 colours. A very fair strain, of somewhat taller growth than the others.
16. *Cocardeau* or *Cockade* (E. G. Henderson & Son). Of 8 colours. A bi or two-coloured form of the Pæony-flowered, the centre white, the outer petals of various colours, strikingly beautiful.

D. GLOBE ASTERS.

A sort of intermediate form between the Chrysanthemum and Pæony-flowered sections; the flowers are large, but rather rough and coarse, and droop somewhat; very free flowering. Height 15 to 18 inches.

17. *Pæony-flowered Globe* (Dippe Bros.). Of 12 colours. A remarkably good selection of colours and of even growth. Excellent for bedding.

E. POMPONE ASTERS.

Plants of very compact neat branching habit, and very free flowering. Height from 12 to 15 inches. Flowers of medium size; very neat and close; the outer petals flat, the centre quilled; a very useful section for cut flowers.

18. *Pompone* (Dippe Bros.). Of 18 colours. A very excellent selection; the white especially fine.
19. *Diamond* (Haage & Schmidt). Of 10 colours. A very good assortment; the flowers somewhat larger than the ordinary Pompone.

F. BOUQUET ASTERS.

Plants of small close habit of growth; from 6 to 9 inches in height; free flowering, the single plant forming a sort of miniature bouquet. Flowers of medium size, from 2 to 2½ inches in diameter. A very inferior section.

20. *New Improved Dwarf Pyramidal* (E. G. Henderson & Son). A mixed selection. Fair.
21. *New Victoria Bouquet* (E. G. Henderson & Son). Violet. Inferior.

22. *New Improved Dwarf Pyramidal* (Dippe Bros.). Of 4 colours.
A good selection.
23. *Boltze's Miniature Bouquet Pyramidal* (Haage & Schmidt).
Of 12 colours. Inferior.

G. SHAKESPEARE.

A very dwarf, very early flowering form of the Bouquet Aster ; the plants from 4 to 6 inches in height, forming a mere tuft of small flowers of no merit excepting earliness.

24. *Shakespeare* (E. G. Henderson & Son). Of 6 colours. A very good selection.
25. *Shakespeare* (Haage & Schmidt). Of 12 colours. Very inferior.
26. *Reine Marguerite, very dwarf* (Vilmorin). Of 6 colours. Average.

H. REINE MARGUERITE ANEMONE (Vilmorin). 10 colours.

This proved a mixture of Chrysanthemum, Pæony-flowered, and Quilled Aster. Very inferior.

I. GERMAN ASTERS, new French varieties (Carter & Co.). 24 colours.

A very excellent mixture of Chrysanthemum and Pæony-flowered.

J. HONEYCOMB.

Plants of medium growth; flowers large, flattish, the petal tubular at base, but flat tipped, and resting quite close on each other; very distinct.

27. *Victoria* (E. G. Henderson & Son). Of 2 colours, carmine-rose and crimson. Very fine.

K. NEEDLE OR HEDGEHOG.

Plants of medium growth; 15 to 18 inches; free flowering. Flowers large, flat; the petals tubular and close pointed. Very distinct in appearance.

28. *Victoria Hedgehog* (Benary). Of 3 colours. Good.
29. *Victoria Quilled* (Wheeler & Son). Carmine-rose. Very fine.

L. QUILLED ASTERS.

Plants of rather tall straggling growth, from 2 to 2½ feet in

height; late flowering. Flowers drooping, roundish, of very even and regular form, from 2 to 3 inches in diameter; the central petals all very evenly and regularly quilled, with a broad flat outer guard petal. The flowers in themselves are extremely neat and handsome; beautiful for cut flowers; but owing to the loose habit and the drooping flowers they are not so effectual for bedding purposes as the other varieties.

30. *Quilled* (Wheeler & Son). Of 12 colours. Very inferior.

31. *Benham's Prize* (E. G. Henderson & Son). Of 18 colours, and the following named varieties:—Firelight, Grand Duchess Maria, Princess of Wales, Princess of the Fairies, Duke of Edinburgh, Prince of Wales, Snowball—were of very good quality.

32. *Betteridge's Exhibition Prize* (Carter & Co.). Of 24 colours, and the following named sorts, being a selection from the 24 colours:—Princess Alexandra, Blushing Bride, Bridegroom, Prince Albert Victor, Prince of Novelties, Purple Prince, Snowflake or Snowball—were of very superior quality, and in general of more compact growth. A superb strain.

X. REPORT on the Varieties of Turnips suitable for Garden Cultivation Grown at Chiswick, 1877. By A. F. BARRON.

THE entire collection was sown on the 1st June for an early crop, which proved successful, the crop growing freely and well, not injured by the fly. This test proved the unsuitability of many of the larger field varieties for early sowing, the hot weather utterly destroying them before they were fully grown, whilst the others continued quite good. A second sowing was made in August for a late crop, which afforded an excellent test also. The report gives the results as ascertained by the Fruit and Vegetable Committees.

Section I. FLESH WHITE, SKIN WHITE.

1. *White Dutch*.

Synonym.—French Turnip (Carter).

Top of medium growth, spreading. Leaves much pinnate. Bulb of medium size, from 4 to 8 inches in diameter, very broad,

regularly flattened, and somewhat hollowed round the base, especially noticeable in the larger specimens; tap root of moderate size; skin white, the top or upper portion generally green. Flesh white. This is one of the oldest of Turnips, and long considered to be the earliest variety, but a true stock is now difficult to obtain. It is best suited for early sowing, comes early into use, but soon grows out of condition.

2. *White Strapleaved.*

Synonyms.—American Strapleaf; Strapleaved White Stone.

Top small, dwarf spreading habit. Leaves short, almost entire or not pinnate as in the ordinary forms, and very distinct in appearance. Bulb of medium size, of even and regular form, a little hollowed at the crown, broad and flat, the tap root small; skin white, flesh white. This is the earliest variety of Turnip, coming into use a few days before any other sort, but soon becomes pithy.

3. *Red Strapleaved.*

Synonyms.—American Strapleaved Red; Early Red Strapleaved American Stone.

This is the same as the *White Strapleaf*, excepting that the upper portion of the bulb is red, or of a bright reddish-purple. It is a very handsome variety.

4. *Green Top Strapleaved* (Carter).

This is a green topped form of the preceding.

5. *Early White Stone.*

Synonyms.—Early White Flat Dutch Garden (Vilmorin et Cie.); Navet de Croissy (Leroy).

Top of medium size. Leaves much pinnate. Bulb medium size, flattened, of fine regular form, with small tap root; skin white. This may be said to be the ordinary form of stone Turnip, of which the *Strapleaved* is a variety.

6. *Early Red Top.*

Synonyms.—Red Top Stone; Early Red Top Flat Garden (Vilmorin et Cie.).

This is again the pinnate-leaved or ordinary form, of which

the *Red Strapleaved* is the variety. These strapleaved and pinnate-leaved varieties of stone Turnips are often intermixed, and require great care in the saving of the seed. It may be noted that the strapleaved forms are earlier than the others.

7. *Snowball*.

Synonyms.—Early Snowball (Wheeler); Improved Snowball (Stuart & Mein); Ball of Snow (Minier); Silver Ball (Nutting); Six Weeks (Nutting); Early Six Week (Minier); Improved Six Weeks (Carter); Stone (Nutting); Early Stone or Stubble (Vilmorin); Nonsuch (Nutting).

Top of moderate size and not spreading so much as the white Dutch. Leaves much pinnate. Bulb of medium size, but grows large, of a very regular globular or roundish ovate form. The tap root small and slender; skin pure white throughout, smooth and handsome. Flesh pure white. This is the best autumn garden Turnip, and the sort usually cultivated. The difference between varieties arises through selections of seed, the tendency being to become more pointed, the correct form being nearly round with small tap root.

Taylor's Cream of Earlies (Taylor).

A variety of the Snowball, having a darker skin. Inferior.

Early Round White Vertus (Vilmorin).

A mixed and inferior stock of *Snowball*.

Sablons Round White (Vilmorin).

A mixed and inferior stock of *Snowball* and *Green Top Stone*.

8. *Green Top Stone* (Nutting).

Synonyms.—Green Stone; Green Top Six Weeks (Nutting).

This is a green topped variety of the *Snowball*. The bulbs more flat. Inferior.

9. *White Globe*.

Synonyms.—Improved White Globe (Carter); Large White Globe.

Top large, leaves deeply cut. Bulb large, roundish, or globular. A much larger, later, and somewhat coarser Turnip than the *Snowball*, which it otherwise resembles.

Pomeranian White Globe.

Coarse and inferior.

Rond des Vertus (Carter).

A late and coarse stock of *White Globe*.

10. *Green Globe.*

Synonyms.—Selected Green Globe (Wheeler); Improved Green Globe (Carter); Green Top Stone (Carter).

A variety of the *Globe*, having the top or upper part of the bulbs green.

11. *Red Globe.*

Synonyms.—Veitch's Red Globe; Early Red Top Auvergne (Vilmorin).

Top of free vigorous growth. Bulb growing to a large size, but useable in a small state; roundish or globular in shape, with small tap root; skin clear white, the upper part of a beautiful purplish-red, and extremely handsome. Flesh white, solid, of excellent quality. One of the handsomest and best Turnips for late or autumn use.

Improved Red Globe.

Inferior.

12. *Long Vertus Pointed Rooted* (Vilmorin et Cie.).

Top very small, leaves short. Bulb of roundish, elongated form, like a Carrot, from 6 to 8 inches in length and 4 to 6 inches in circumference, irregular, frequently twisted and tapering to a blunt point. The greater portion of the bulb is raised out of the ground. Skin pure white. Flesh white, solid, and excellent. This variety comes very early into use, and is well suited for forcing or growing in frames for an early supply.

13. *Navet de Clairfontaine*.

Synonyms.—Long Early White Vertus; Long Clairfontaine (Carter); Long White Clairfontaine (Vilmorin).

Long White Meaux (Vilmorin).

Cow Horn (Carter).

Jersey Navet (Veitch).

Des Sablons (Carter),

Navet des Sablons Pyriforme

(Leroy).

These are all inferior varieties of the preceding, differing somewhat in the size or earliness of the bulb, or in the colour of the top part, some being green, others white.

14. *Long Grey* (Carter).

Synonym.—Long Green Tankard (Vilmorin).

Top medium. Bulb very long and narrow, twisted or crooked. Skin white, the upper portion green. Flesh white. A useless variety.

15. *White Tankard*.

Top large, leaves long. Bulb long, from 6 to 8 inches, and 7 or 8 inches in circumference, regularly tapering. Skin white. Flesh white, but rather coarse.

16. *Green Tankard*.

A green topped variety of the preceding.

17. *Long Red Tankard* (Vilmorin et Cie.).

Synonym.—Rose du Palatinat (Carter) (Leroy).

Top of medium size. Leaves deeply cut. Bulb large, 12 inches long, rising out of the ground one-half its length, and from 12 to 18 inches in circumference. Skin clear white, the upper portion pale purplish red and handsome. Flesh somewhat coarse.

Yellow Tankard (Wheeler & Son).
Dale's Hybrid (Minier & Co.).
Fosterton Hybrid (Minier & Co.).
Large White Globe (Vilmorin et Cie.).
Norfolk Large Green Round (Vilmorin et Cie.).
Norfolk Large White Round (Vilmorin et Cie.).
Norfolk Large Red Round (Vilmorin et Cie.).
Hardy Green Round (Minier & Co.).
Large Purple Top (Carter).
Purple Top Mammoth (Carter).
Grey Stone (Carter).
Devonshire Grey Stone (Minier & Co.).
Mammoth Grey Stone (Minier & Co.).
Green Barrel (Carter).

These are all white Turnips of large size, and too coarse for garden culture.

18. *Grey Morigny* (Carter).

Synonym.—Gris de Morigny (Vilmorin et Cie.).

Top small. Leaves short spreading, much cut or pinnatifid. Bulb of medium size, long, regularly tapering, like a Beet. Skin dark brown or grey, very rough. Flesh white, dry. Is of excellent quality for late winter use.

Section II. FLESH WHITE, SKIN BLACK.

19. *Long Black*.

Synonym.—Long Noir d'Alsace (Leroy).

Top small spreading. Leaves much cut. Bulb medium size, from 6 to 10 inches long, of regular tapering form, and about 4 inches in diameter. Skin very rough, almost black in colour. Flesh white, solid, of excellent quality. A good winter sort.

20. *Round Black*.

Synonyms.—Chirk Castle ; Chirk Castle Black Stone.

Top small spreading, of a distinct appearance. Leaves small, much cut. Bulb of medium size, quite round or globular in shape,

with a small tap root. Skin very rough, of a very dark brown, almost black, colour. Flesh pure white, solid, and of fine quality. An excellent sort for winter use, withstands frost well.

Section II. DRY FLESHED.

- | | |
|--|---|
| 21. <i>Freneuse</i> (Vilmorin et Cie.). | } These are small dry
fleshed Turnips not well
suited to this climate, but
esteemed on the Continent.
Failed. |
| <i>Grey Luc</i> (Vilmorin et Cie.). | |
| <i>Saulier</i> (Vilmorin et Cie.). | |
| <i>Teltauer</i> (Vilmorin et Cie.). | |
| <i>Green Topped</i> (Vilmorin et
Cie.). | |

Section III. FLESH YELLOW, SKIN YELLOW.

22. *Yellow Finland.*

Top very small, leaves short, spreading. Bulb small, from 4 to 6 inches in diameter, of a very even and regular roundish form, somewhat hollowed at the base. Tap root exceedingly small and fine. Skin very smooth, of a pale orange-yellow colour, the upper part pale green. Flesh yellow, very solid and excellent. Very early. A good Turnip for summer or autumn use.

23. *Malta.*

This is very similar to the *Finland*, but of somewhat larger and stronger growth.

24. *Yellow Dutch.*

Top dwarf spreading. Bulb of medium size, roundish, with flat base. Skin rough, pale yellow, the upper portion deep green. Inferior to *Malta*.

25. *Golden Ball.*

Synonyms.—Improved Golden Ball; Robertson's Golden Ball Orange Jelly.

Top of free erect growth. Bulb roundish, even, and regular, with small tap root. Skin deep orange throughout, smooth. Flesh deep orange, solid, and of good quality. An excellent Turnip for autumn use.

26. *Golden Stone* (Nutting & Son).*Synonym.*—Scarisbrook.

Top of small size. Bulb of medium size, evenly formed, roundish or globular. Skin pale straw-yellow, smooth. Flesh pale yellow, firm and solid. An excellent sort.

27. *Green Top Scarisbrook* (Nutting).

A variety of *Golden Stone*, with a green topped bulb.

28. *Yellow Montmagmy*.*Synonyms.*—Yellow Flat Red Top Montmagmy; Flat Red Top Yellow.

Top small. Bulb of medium size, of fine even form, roundish, with small tap root. Skin yellow, the upper portion dull red. Ripens off early in warm weather.

29. *Long Yellow* (Vilmorin et Cie.).

Top small spreading, dying off early. Bulb of medium size, elongated, of regular tapering form like a Carrot. Skin yellow. Flesh pale yellow, somewhat soft.

30. *Bortfield* (Benary).

Top small, close growing. Bulb small, from 9 to 12 inches long, regularly tapering. Skin orange. Flesh orange-yellow. Very hard and dry.

*Yellow Altringham.**Yellow Scotch.**Green Top Scotch.**Purple Top Scotch.**Purple Top Yellow.**Yellow Green Top Aberdeen.**Warrington* (Nutting).*Market Jew* (Nutting & Son).*Dale's Hybrid Green Top Yellow* (Wheeler).*Dale's Hybrid* (Minier & Co.).*Yellow Tankard.**Stratton Green Round* (Minier & Co.).

Are all large varieties, too coarse for garden cultivation.

XI. On Fungoid Diseases of the Vine. Part I. By Dr. M. C. COOKE.

[Read at Meeting of Scientific Committee, 15th January, 1878.]

THE Vine is such an important object in the eyes of the horticulturist that it scarcely needs any apology for offering to this Committee consecutively at its meetings a summary of the different species of Fungi which have at divers times and in different countries been found living and thriving, sometimes inflicting considerably injury, upon this valuable plant. By doing this it is hoped that those who read from time to time the proceedings of this Committee may be assisted to some information which could not otherwise be very readily procured, whilst the Committee itself will not be impatient of being reminded of many things with which its members may individually be well cognisant in furtherance of a public object.

Oidium Tuckeri, Berk.—Commencing with the well-known Vine-Mildew, under its old name, it may be well to confess that we can add nothing to what all European horticulturists have acquired by a painful experience. So much has been written concerning the *Oidium*, that it will be almost sufficient to mention its name, and pass on to other and less familiar parasites. Technically, all we know of this Fungus is the condition of an *Oidium*, whilst we have no doubt whatever that, like the Hop-mildew and the American Vine-mildew, this is only an imperfect or conidial condition of some higher Fungus belonging to the genus *Erysiphe*, or some allied genus. It seems to be extremely probable that it is but the conidia of an *Uncinula*, of which the mature or sporangial condition has not yet been observed. Our reasons for referring it to this genus are based on the known affinities which certain genera of parasites have for allied plants, and since we know that two or three species of *Uncinula* are developed in other countries upon species of *Vitis*, whilst but one instance is known of a true species of *Erysiphe* or *Sphaerotheca* being found even on a kindred order of Phanerogams, we assume it to be a probability that the Vine-disease is a conidial condition of a species of *Uncinula*. Add to this the fact that there is scarcely any appreciable difference between the conidia of *Uncinula spiralis* and the Vine-disease, and this supposition is strengthened.

It is scarcely possible to refer to this subject on the premises of

the Royal Horticultural Society, without recording the feeling of gratitude with which we all revert to the labours of the Rev. M. J. Berkeley in this and kindred subjects, but especially for his untiring perseverance in the investigation of the diseases of the Vine, Hop, and Potato. In the earlier volumes of the Journal of this Society, those memoirs of his will continue to testify to his great services to horticulture, as they have formed the basis of all subsequent researches.

Uncinula spiralis, Berk. & Curt.—This is the American representative of the European Vine-mildew, and was first noted by Berkeley as a distinct species in his "Introduction to Cryptogamic Botany." It appears first as an *Oidium*, scarcely, if at all, differing from *Oidium Tuckeri*, and afterwards freely produces conceptacles, which the European *Oidium* does not. Recently Dr. Farlow has given some interesting details of this species in the "Bulletin" of the Bussey Institution, which may be reproduced with advantage. "During the past year," he says, "this *Uncinula* was more common in Eastern Massachusetts than the year before, but not, however, so common as *Peronospora viticola*. The two Fungi were not unfrequently found growing together on the same leaf. In the West, however, the *Uncinula* seems to have caused more trouble than in the East, and in California it prevailed to such an extent as to have seriously injured the Vines. The Fungus was so common that it was frequently exhibited at agricultural societies, where it seems to have generally been called *Oidium Tuckeri*, on the supposition that it was the Fungus to which that name is applied in Europe.

"In midsummer and autumn the leaves and young stalks, of both our cultivated and wild Grapes are covered with the white spots of *Uncinula spiralis*, which look not unlike dust. The spots are plainer on the upper than on the lower surface of the leaves while the spots made by *Peronospora viticola* are principally on the lower surface of the leaf, and look more like frost than dust. The spots grow larger and larger until they cover the whole leaf, the young stalks, and the berries themselves. A microscopic examination made early in the season shows that the spots are composed of white mycelial threads, which branch in various directions, and are furnished at intervals with suckers, by means of which the Fungus is attached to the epidermis of the leaf. The diameter of the filaments is about .004 millimetres, and the transverse cell-walls are numerous. The conidia are produced in the following

manner:—Some of the branches of the mycelium rise up from the surface of the leaf, either obliquely or at right angles. Frequent constrictions are formed, and transverse walls are produced at the constrictions, thus forming a number of cells which are the conidial spores. The uppermost cell grows larger than the rest and drops off. The next cell then enlarges, and drops off in the same way, and new cells are formed in the filament, so that a succession of conidial spores is formed, which ripen and drop off. The spores germinate at once by pushing out a germinating tube, generally at one end, not by producing a number of zoospores as in *Peronospora*.

“Late in the autumn the perithecia and asci of the Fungus are formed, and they are ripe about the last of October. As seen by the naked eye the perithecia look like small black bodies. They occur on both surfaces of the leaves, but are most easily distinguished on the smooth upper surface, inasmuch as the under surface of the leaves of most of our Grapes is covered with hair, by which the perithecia are concealed. The central mass is an opaque sac with a cellular wall, from which is given off a number of appendages which are rolled up at the end. The perithecium measures from .07 to .12 millimetres in diameter. The appendages are from fifteen to thirty-two in number, generally very numerous, and are from three to five times as long as the diameter of the perithecium itself. There are several cross-partitions in the appendages, and they occasionally branch. At the base they are brownish-yellow, but grow lighter-coloured at the top, which is quite hyaline. In removing the perithecia from the leaf the appendages are frequently broken off in the middle, so that it looks as though the Fungus were a species of *Erysiphe* proper, rather than an *Uncinula*. Inside the perithecia are the asci or sacs attached at the base, and containing the spores. The asci vary from four to eight in number, but the more frequent number is six. The spores also vary in number, the average being six.

“In short, the *Uncinula spiralis* appears in two phases: first, in the form of a white flocculent mould on the leaves, stalks, and grapes in midsummer; and secondly, in the form of perithecia, with rolled appendages, later in the season. Compared with *Peronospora viticola*, it is more superficial, growing over the epidermis; but, on the other hand, is practically more dangerous, as it attacks the fruit, which is not the case with the *Peronospora*.

“If there is any difference between the European *Oidium Tuckeri*, and the conidial form of our own *Uncinula spiralis*, it lies in the somewhat smaller size of the latter; but that could hardly be called a specific difference, since Mohl has called attention to the fact that the spores of *Oidium Tuckeri* itself are variable in size. What is called *Oidium Tuckeri* in this country is nothing more than the conidia of *Uncinula spiralis*, and we have repeatedly received specimens bearing the former name, which had been exhibited at horticultural meetings, and learnedly explained, without the slightest reference to the abundant perithecia which clearly showed the species to be *Uncinula spiralis*.”

We can add but little to this excellent summary of the history of the American mildew by Dr. Farlow, except to say that the species was technically described by the Rev. M. J. Berkeley, in “Grevillea,” vol. iv., p. 159, and that it differs considerably from the species of *Uncinula* which is common in Britain on Poplars and Willows, although that species will convey a good idea of the character of the genus to which the above species belongs. It should be distinctly observed that Dr. Farlow has no hesitation in declaring that the *Uncinula spiralis* is destructive in its character.

Uncinula americana, Howe.—About the year 1872 Dr. Howe described under this name a species of *Uncinula* found on the leaves of *Vitis* in the United States, and which he regards as different from the *Uncinula spiralis*. Having examined carefully authentic specimens of both forms, it may not be out of place to point out wherein they differ, and also wherein they agree, so as to arrive at some conclusion on the disputed point.

In size the conceptacles are really identical. The fulcræ are about twice as long, and consequently more flexuose. The curved tips are essentially the same. The mycelium and conidia present no appreciable differences, and neither the number of sporangia in each conceptacle, nor the number of sporidia in each ascus, present any points of divergence. The whole difference resolves itself into a question of length in the fulcræ, for the average number of fulcræ produced by one conceptacle is about the same. It must be conceded that the length of the fulcræ in *Uncinula spiralis* is by no means the same in all localities. Comparison of leaves from three localities has satisfied us that the average length differs in all, and doubtless an extended examination of a long series of leaves from numerous localities, or collected in different years,

would show all stages intermediate between what are regarded as the typical forms of *Uncinula spiralis* and *U. americana*.^{*} Altogether there appears to be no greater difference between them than such as may reasonably be attributed to the variability of a single species.

Uncinula subfusca, B. & C.—This is another North American species of *Uncinula* which occurs on the leaves of *Ampelopsis quinquefolia*, although we have no evidence of its having occurred on a true species of *Vitis*. The manuscript name of *Uncinula ampelopsidis* has also been applied to this species, but it was not published, in so far as we are aware, previous to the description by Berkeley and Curtis. Compared together under the microscope, there is a considerable difference between this and *Uncinula spiralis*. The fulcra are shorter, more robust, fewer in number, and rather more decidedly coloured. Perhaps the internal structure does not differ to any appreciable extent. If any two of these forms are to be regarded as distinct species, the third must also be recognised as such, since the points of divergence are the same in all. For our own part we should prefer to regard them as three varieties of the same species; but it is exceedingly difficult to induce botanists who confine their observations to their own flora, to admit the extent to which variability in a single species may be induced by a change in the external circumstances under which it may be produced.* In this instance a different foster-plant may make all the difference in the length of the fulcra, which after all is the chief distinction.

None of the three forms have as yet been discovered beyond the limits of North America.

NOTE.—*Sphærotheca mors-uæ*, Schwz.—This is the one solitary instance of a species of *Sphærotheca*, having been found on Vines. It was first described by Schweinitz nearly fifty years since as occurring on Grapes in the United States, where it certainly seems to be rare, since it is seldom mentioned by American mycologists. Although described as a species of *Erysiphe*, the Rev. M. J. Berkeley has referred it to the genus *Sphærotheca*, but we have never had the fortune to see a specimen, and therefore can add very little beyond the name, which even had passed from our memory when the above communication was made to the Scientific Committee.

* Compare *Uncinula adunca* as developed on Willow with specimens grown on Poplar for a confirmation of this.

On Fungoid Diseases of the Vine. Part II. By Dr. M. C. COOKE.

[Read at Meeting of Scientific Committee 19th February, 1877.]

IN following up the series of communications which were promised at the last meeting, it may be as well to allude at once to the American *Peronospora* as a sequel to the American Vine diseases noticed in the previous paper. As on that occasion, so in the present, we shall avail ourselves freely of the observations made on the spot by Dr. Farlow,* since they must necessarily have been made under much more favourable circumstances than it is possible to achieve for ourselves, since we are compelled to study it from dried specimens only.

Peronospora viticola, Berk. & Curt., is confined solely to the United States, as far as we know, and there it attacks almost all the species or varieties of Vine. It makes its appearance about the 1st of August, and at any time from the middle of the month until frosty weather sets in, one can be almost certain of finding it. It develops first on the under surface of the leaves, most abundantly on the veins near the petioles, and afterwards on spots all over the under surface. It is most easily recognised on *Vitis cordifolia*, where the under surface of the leaves is smooth, and where the frost-like substance of the Fungus is in strong contrast with the green leaf on which it grows. When growing on *Vitis Labrusca*, *Vitis aestivalis*, or cultivated varieties of these species, it appears in the form of spots, at first white, then rusty, slightly raised above the level of the hairs of the lower surface. Sometimes the Fungus invades the petioles of the younger leaves, which swell considerably beyond their usual dimensions. As the disease advances, the Fungus spreads over the whole of the lower surface of the leaves, until not unfrequently scarcely a healthy leaf remains; red spots appear, which expand until the leaf becomes dark-brown and shrivels up. During August the disease in the region of Boston advances gradually, until, towards the middle of September, almost every leaf is affected and hangs dead upon the branches.

The mycelium is profuse throughout the cellular system of the leaf, and the fructifying threads force their way through the stomata, often several of them together, a portion of which seem to grow faster than the rest and become fertile. The erect threads

* On the American Grape Vine Mildew, by W. G. Farlow, in Bulletin of the Bussey Institution.

are branched in rather a compact manner, the tips of the ultimate ramuli being mostly ternate, on which are borne the large oval conidia. These latter are without papillæ at the apex, which occur in many species of *Peronospora*. In size they are variable between $\cdot 0125 \times \cdot 0083$ mm. and $\cdot 03 \times \cdot 017$. The ramification and general appearance is very different from that of the Potato-mould, perhaps more nearly like that of *Peronospora nivea*, but much larger.

The observations made by Dr. Farlow on the germination of the conidia, or rather the production of zoospores, and their ultimate germination, are so important and interesting that they must be detailed somewhat *in extenso*. The experiments were made in the beginning of October. Affected leaves were gathered in the afternoon and kept under a moistened bell-glass during the night. In the morning the portions which had developed fresh conidia during the night were cut out and the conidia shaken off into a little water contained in watch-glasses. In order to test the conditions of germination, some of the bell-glasses were placed in a light room and others kept in the dark, and sowings were made also at different periods of the day. The result was uniformly the same, whether in the dark or the light. Sowings made at any period of the day also germinated, but the conidia sown in the morning generally germinated somewhat more quickly and more abundantly than those sown in the afternoon. This is explained partly by the fact that the conidia sown in the morning were in better condition, the result of a growth of fourteen or fifteen hours, while those sown in the afternoon were the conidia produced during only the four or five hours of the forenoon. In all cases the germination took place with a surprising rapidity and regularity. At the end of an hour the conidia were swollen, and division of their contents commenced. At the expiration of an hour and a quarter the segments had resolved themselves into a number of oval bodies collected towards one extremity of the conidia, and soon afterwards the cell wall was ruptured and the oval bodies made their escape.

They passed out slowly, usually one at a time, pausing a little in front of the opening. In a short time each moved more and more actively, and finally darted off as a fully-developed zoospore furnished with two cilia. Sometimes not more than three emanated from one conidium, usually five or six, but in one instance as many as seventeen were counted. The zoospores varied in length from $\cdot 008$ to $\cdot 01$ mm. They moved about for from fifteen

to twenty minutes, the motion becoming gradually slower ; at the end of that time it ceased, the cilia dropped off, the zoospores assumed a spherical shape, and in a quarter of an hour an out-growth appears at the side, which develops rapidly into the mycelium of a new plant. Dr. Farlow states that he never saw the direct production of hyphæ from the conidium itself, but always from the zoospores.

As to the rapidity and regularity of this germination, he observes that it was so regular that by properly arranging the time of sowing he was able to be tolerably certain of a crop of zoospores for class demonstration at any given hour. In about two hours from the time of sowing the conidia the intermediate stages will have been passed, and germination of the zoospores commenced. Time and time again he has sat with his watch before him observing the changes, and almost punctually to the minute the discharge of zoospores has begun.

Oogonia have only been found by him on *Vitis æstivalis*, in the latter part of September and October, in the shrivelled parts of the leaves, and most abundantly just inside what are called the palisade cells of the upper surface. They are spherical, .03 m. in diameter, smooth, with a thick yellowish episore, but hitherto he has been unable to secure their germination. Perhaps he may not have given them a sufficient period of rest.

In order to complete his investigations in all possible practical directions, we find that Dr. Farlow pursued some successful experiments in inoculation. This was done by placing healthy leaves upon infected leaves and covering with a moistened bell-glass. In two cases the Fungus appeared on the healthy leaf at the end of the second day. Again, germinating zoospores were sown on healthy leaves of *Vitis vinifera* and of smooth-leaved American species. The Fungus appeared on the leaves of *Vitis vinifera* on the fifth day after sowing ; on American species a day or two later. The Fungus grew luxuriantly on *Vitis vinifera*, and soon covered the leaves. There is no reason to doubt, if once introduced into England, it would soon establish itself.

This parasite is very abundant on leaves of *Vitis æstivalis*, *Vitis Labrusca*, and all their cultivated varieties ; on *Vitis cordifolia*, *Vitis vulpina*, and the cultivated Catawba Grape ; and in fact on nearly all varieties of American Grapes, although it has not been recorded on the Diana Grape. It is probably found throughout the whole United States east of the Rocky Mountains, but it has not yet been reported from the west coast.

It is believed that it has no injurious effect upon the Grape crop; indeed, according to Dr. Farlow, it is perhaps beneficial, for he says, "Our native Vines have a luxuriant growth of leaves, and the danger is that, in our short summers, the grapes will not be sufficiently exposed to the sun to ripen;" he then proceeds to show that the *Peronospora* arrives at the happiest moment, to shrivel up the leaves so that the direct rays of the sun may reach the grapes. Should the Fungus be introduced into Europe, however, he thinks that the case might be different, and attacking the Vines earlier, prove in a moister atmosphere as disastrous as the *Phylloxera*. At any rate, we can assure him that we are by no means anxious to try the experiment.

XII. On the Cyclamen. By the EDITOR.

[Read at Society's Meeting, 19th February, 1878.]

I HAVE to-day to address you on the Cyclamen, a truly florist's flower, but at the same time one that has long been known and appreciated, when by no means so attractive as it is in our day, as our Spring Shows abundantly testify.

Two of the hardy species, *Cyclamen Coum* and *hederæfolium*, are mentioned as having been in cultivation in Gerard's garden so long ago as 1596; so at least says Mr. Daydon Jackson in his identification of Gerard's species. *C. persicum* seems to have been introduced by Sibthorp, in 1731, from the Isle of Cyprus.

In Curtis' Botanical Magazine, which was commenced in 1790, the fourth plate in the first volume is a very fair representation of *C. Coum*, which is said to be found growing in woods and shady places in Italy and Germany; it is also noted that it is a very early flowerer. The plate in Curtis represents a tiny little plant with small rosy flowers on rosy peduncles, leaves round and unvariegated. The original *C. persicum*, though more beautiful with its pure delicate petals and graceful habit, is a long way behind the magnificent specimens we have so often seen in recent years, to which I shall allude presently.

As a genus, the *Cyclamen* is confined to the countries bordering on the Mediterranean—S. Europe, W. Asia, and N. Africa. It can scarcely be considered an English plant, though it

may be found growing wild in some Kentish woods ; it is almost certainly naturalised, the seed having been originally carried from some garden, and thus it has established itself as in a state of nature.

The *Cyclamen* is a very worthy member of the Natural Order *Primulaceæ*, which contains so many popular favourites. Amongst other distinctions the chief points of note in examining flowers belonging to this Order are—

- 1st. That the corolla is invariably *monopetalous*—that is, the petals are all united together in one piece in a tube, the extremity of which is, however, usually divided into several lobes or segments, usually five in number ; so that in speaking of the petals of a *Cyclamen* we mean the separate segments of the united corolla ; and
- 2nd. That the stamens are inserted upon the corolla, and opposite to the several lobes.

There is also the capsuled many-seeded fruit.

In the genus *Cyclamen* the segments of the corolla are always reflexed, or doubled back, and sometimes twisted.

There appears to be no little confusion in the determination of some of the species, as there unquestionably is a misapprehension amongst the trade, both here and abroad, on the subject of nomenclature ; even our best authorities differ. It is most desirable, therefore, that a general understanding be arrived at, if possible, whereby it shall be recognised what really are the points of difference between the various species. With the kind aid of several well-known *Cyclamen* growers, I have made an attempt in this direction, which may perhaps be of some use until a better arrangement can be supplied. Here at starting a serious difficulty meets us : upon what are we to base our distinctions so that no mistake can possibly occur, so that when a plant is shown it may be possible to say definitely, this is *hederæfolium*, or *ibericum*, or *vernum*, as the case may be ? The leaves furnish *one* of the main distinctions, but only in conjunction with other features. Many authorities lay great stress upon the *colour* of the upper and under surfaces, but this is fallacious ; and not much less so with the *form* of the leaf. Take *hederæfolium* for example ; you have ovate, cordate, hastate, and sub-hastate leaves, and all may be produced from the seed of a single plant. Leaves may therefore *assist* in identification, but cannot *alone* determine it. We must look to other points to assist us in our task.

The *corm* is a very important feature, and one which deserves consideration—its shape, its habit, the mode of issue of the fibre, a careful examination of which will probably throw valuable light on this vexed question; for if we consult the authorities we shall most certainly be led astray in many instances: for example, in the Bot. Mag., plate 1001, is figured a plant under the name of *Cyc. hederæfolium*, which on examination proves to be *vernum*. The same plant is figured in Sweet's Fl. Garden as *repandum*, pl. 117; and again the same writer, pl. 9, figures *C. ibericum*, but calls it *vernum*; and later writers, copying from the earlier ones, have only perpetuated these errors.

In all, though many more names have been given, for all practical purposes the number of species of *Cyclamen* may be reduced to six, viz.:—

C. Coum.

„ *ibericum*, incl. *C. Atkinsi*.

„ *vernum*, syn. *repandum*.

„ *europæum*.

„ *hederæfolium*, with its geographical forms—

C. Africanum or *macrophyllum*, and

C. Græcum or *latifolium*.

„ *persicum*.

There may be, I should say there are, other little-known species to which at present I have not had access.

There is another point of distinction worthy of note, illustrating as it does the fact that every season has its *Cyclamen*.

Persicum and *vernum* cheer us in the spring with their bright vivid flowers.

Europæum comes on later, and may well be distinguished as the summer-flowering species. In the autumn we have *hederæfolium*; and when that is done, all through the winter the chain is completed by the little *Coum* and *ibericum*, which are then in full bloom. This is a very marked distinction, by the aid of which closely resembling individuals may perhaps be determined with certainty.

There seem to be four distinct habits of the corms or tubers, as follows:—

Corms smooth, roots proceeding from
the centre of the under surface . *Coum, ibericum, vernum.*

Corms rough, roots proceeding from
the base of the tuber, but more
or less from all parts . . . *europæum.*

Corms large, rough, fibrous, roots

proceeding from all parts of the

tuber *persicum, hederæfolium*.

There is a form of *hederæfolium* with a very distinct habit of tuber. The roots proceed from one part of the under surface, a little removed from the centre of the corm, whilst the growing point on the upper surface starts from a corresponding point on the opposite side of the centre, and this peculiarity is said to be constant. I have examined specimens, but my personal knowledge of this variety is not yet sufficient to enable me to do more than allude to it at present.

We now come to the leaves, of which there are four main variations in form and habit.

I.—Round or reniform.

Not marbled *Coum*.

Marbled on upper surface *ibericum*.

Sometimes inclined to be cordate *europæum*.

II.—Cordate, crenulated on margin, upper

surface marbled *persicum*.

III.—Angular, toothed, broadly marbled

on upper surface, leaves rising
with the flowers. *vernum*.

IV.—Angular, lobed, marbled, leaves suc-

ceeding the flowers *hederæfolium*.

Finally, as a less reliable guide, we have fragrance, but here there does not seem to be any unchangeable or distinct habit. *Europæum*, *vernum*, and *persicum* are said to be always fragrant. So they are in nature, but in cultivation this very desirable quality is in great measure lost, and in the large otherwise improved *persicums* entirely so. *C. Coum*, *ibericum*, and *hederæfolium* are always scentless, except the two forms of the last—*Africanum* and *Græcum*—which are sometimes fragrant.

We will now proceed to a closer examination of the six species I have named.

I.—*C. Coum*.

A native of Italy and Germany.

Blooms from January to March. Colour bright rosy red, with a white band more or less distinct round the corona. Leaves always round, dark green on the upper surface, decided purple on the

reverse. No markings. Tubers round, compressed, smooth, roots descending from the centre of the underside.

It is very hardy, and flowers freely in the open air. There is but very little variation in this species, which can be easily recognised, for no other *Cyclamen* has its small plain round leaf or short little flower.

II.—*C. ibericum*.

A very near relation to the foregoing—so near indeed that but for the difference in the leaf it might easily be mistaken. I have a white variety of *C. Coum* in which the plant is unquestionably *Coum*, but the flower is just as certainly *C. Atkinsi*, a white variety of *ibericum* to which I shall recur.

Leaves cordate, they are seldom round, always marbled with lighter colour on the upper surface. The tuber is similar in habit to *C. Coum*, but the whole plant, corm, leaves, and flowers, is bolder in habit.

Mr. Atkins, of Painswick, a gentleman who has spent many years of his long life in horticultural pursuits, raised a very beautiful variety of this species with pure white flowers, which some have said to be a hybrid between *C. Coum* and *C. persicum*. This is not impossible, though there is a strong belief that the plant known as *Cyclamen Atkinsi* is no more than a white seedling of *ibericum*; the flowers are certainly finer in form than either *C. Coum* or *ibericum*—a feature which doubtless gives weight to the opinion that it is a hybrid; but when it is remembered how great has been the improvement effected in *C. persicum* during the last few years, through careful selection and cultivation, it need scarcely be a matter of surprise that the other species respond to like care and develop into much finer forms than any we have yet seen, of which, with due deference, I believe *C. Atkinsi* to be an example, and not less an encouragement to cultivators to direct their attention to these useful and hardy plants. I give both opinions on this subject, and though I incline to the latter, I desire to give the former due prominence. In some catalogues there are named varieties of *C. Atkinsi*—as, for example, *rubrum*, *roseum*, &c.—but it is certain that the founder of the variety will not admit them to be *C. Atkinsi* at all. Mr. Tyerman says that a very interesting series of Iberian specimens of *C. ibericum* have lately been added to the Royal Herbarium at Kew, which quite confirm the identity and variability of this plant.

III.—*C. vernum*.

As its names indicates, a spring-flowering species, in bloom during March and April. There is much controversy as to the identity of this plant, arising from mistakes, afterwards corrected, made by early authorities. So much so that in some catalogues a distinction is drawn between the true *vernum* and the *vernum* of Sweet, which, as I have already pointed out, is really *ibericum*, a winter-flowering species, and in support of this statement I quote Mr. Atkins. Writing to me, he says :—"See Bot. Mag., t. 1001, figured as *hederæfolium* ; this is the true *vernum*, called *repandum* in the Flower Garden, and various other names here and abroad. The name *repandum* does not appear to have been used before Sibthorp, who associated the plant he thus names with Clusius *Cyclamen verno tempore florens*."

On the other hand, Colonel Trevor Clarke, a botanist whose opinion is entitled to the utmost respect, writes thus to me :—"The plant that occupied the name of *vernum* for many years was scarcely distinguishable from *Coum*, except by the leaf. I think it was a pity to disturb *repandum*, which was already muddled up with the autumnal *hederæfolium*, whilst the latter was confused with the summer-flowering *europæum*."

The flowers of *C. vernum* are very fragrant, in colour bright rosy purple, less frequently light rose, rarely white.

Leaves broad, angular, and deeply lobed, the upper surface bright green, shining, and broadly marbled with silvery bands.

Corm smooth, dark yellow, the roots proceeding from the centre of the underside of tuber.

Mr. Tyerman remarks :—"This interesting species is quite distinct from any other. The leaves and flowers somewhat resemble those of *hederæfolium*, but the flowers are longer, more slender, and destitute of the teethlike projections formed by the reflexed segments of the corolla." The flowers and leaves are produced at the same time. This species is a native of Greece and Italy.

[NOTE.—Since writing the above, I have prosecuted my inquiries amongst the great *Cyclamen* growers on the Continent, who, while freely admitting the inaccurate nomenclature which holds amongst them, explain that it would be almost impossible to adopt the more strictly correct names, as the former are now so generally used that the utmost confusion would ensue on any attempt to effect a correction.

As regards "*repandum*," however, it would seem that the weight of Continental evidence is to the effect that the irregularity of the growth of the root and leaves from the corm noticed by me on p. 79, together with an irregularity in the form of the segments of the corolla, are the distinctive features of this species, which I am assured are constant. If this be so it would certainly justify specific distinction between *vernum* and *repandum*.]

IV.—*C. europæum*.

Figured in Sweet, p. 176. A summer-flowering species, blooming from June to September, or even later. In cultivation this plant is by no means a free bloomer, but it is valuable as one of the most delightfully scented of all the Cyclamens. It is very distinct, both in form and habit, and there should be no great difficulty in recognising it.

The flowers vary in colour from a pale pink to a deep carmine, the mouth of the corona is wide and slightly angular.

Leaves orbicular or reniform, somewhat denticulate, marbled on the upper surface.

The tubers are irregular in shape, and grow frequently to a great size; rough, dark in colour, compressed; roots proceed mostly from the under surface, but more or less from all parts of the tuber.

In habit it differs from other Cyclamens in forming short gouty stems, which produce leaves and flowers, these stems if cut and planted will again strike root and produce plants. The growing shoots for leaves and flowers have a way of stoling horizontally under ground for some distance before seeking the surface and developing, a habit likewise of *hederæfolium*, so that in pots when the spring growth is commencing the plant assumes the appearance of a nest of shoots.

V.—*C. hederæfolium*.

This is the autumn flowering species, that to which I have before alluded as found growing wild in some woods in Kent; but its native home is on the mountains of Switzerland, as well as in Italy, Greece, the Ionian Isles, Algeria, and elsewhere. Under this species should be classed a few others which have been described under different specific names, they are, however, only geographical forms of the same species. *C. Africanum* or *macrophyll-*

lum, a large coarse growing variety, and *C. græcum* or *latifolium* is another, so also is *C. neapolitana*, and on the Continent this species is also known as *C. autumnale*.

There is considerable variety both in shape and hue of the foliage as in the colour of the flowers, the former being sometimes dark green, and almost free from marbling, and at other times really beautiful with bright silvery bands and markings. In the leaf this species most nearly approaches *C. vernum*, with more or less prominent lobes. The flowers vary in colour from pure white to the deepest rose, the reflexed sections of the corolla display at each edge a tooth-like projection, giving to the corona of the flowers a peculiarly diadem-like appearance.

The tubers are very large, sometimes as much as 12 inches in diameter, round, compressed, dark brown, very rough, the roots proceeding from all parts of the corm.

Regarding *C. hederæfolium*, the Hon. Rev. Mr. Boscawen writes to me that he has had it planted in the open ground for the past fifteen years, where it flourishes, so that we may say it is quite hardy, having been unaffected by 20 degrees to 30 degrees of frost.

VI.—*C. persicum*.

Of this well-known species it is unnecessary for me to say very much; it is *the Cyclamen par excellence* for fragrance, colour, and display, and it is upon this plant that the cultivator has spent his most earnest devotion. The finest specimens grown come to Covent Garden Market, and so great is the demand that one firm alone sends out from 15,000 to 20,000 plants annually; but in proportion as the flowers are improved in size, it appears certain that they lose in fragrance, because in its natural condition *C. persicum* is so fragrant that a single plant of it in bloom will fill a large room with its scent.

Mr. Boscawen writes to me: "I have had *C. persicum* in the open air for five years or longer, the plants are some of them under slight shade, others exposed on a north bank; they are, when in a north aspect, evergreen. I send you leaves that are over a year old. When evergreen they do not blossom so well in winter, the frost does not seem to injure them, the blossom sent stood 10 degrees of frost last week. I do not think since I have had *persicum* out we have had over 16 degrees of frost, however there has been skating within a few yards of the bank where they were growing."

It is to this species that my remarks on the cultivation of the *Cyclamen* mostly apply. All other species being hardy, or at least half-hardy. There is one peculiarity which distinguishes *persicum* from all the other species of *Cyclamen*. In all the rest, as soon as the flower has been fertilised, and the seed-pod formed, the peduncle commences to assume a spiral form, and as the seed ripens it is thus carried as on a contracting corkscrew down to the ground, and eventually under the surface, where it may germinate; *persicum* is an exception to this rule.

Cultivation.

In the matter of cultivation a complete and utter change has of late years been effected in the management of this plant, and with startling results.

An eminent cultivator said to me the other day a lady once called upon him some eight or ten years ago, and said she wished to grow *C. persicum* in a little glass frame, known as the "Waltonian," in a sitting-room, and hoped to do wonders with them. He let her have some seed, and eight months after she wrote to him, declaring that the plants raised from his seed were then in flower. His reply was, "Get a certificate from the clergyman of your parish, and then I will believe you, but not without." The thing was regarded as an impossibility, and my friend's incredulity was scarcely to be wondered at. That, however, struck the keynote. Rapidity of growth, no cruel drying process, by which the very life-blood, as it were, of the plant was driven away. Rest; but with sufficient moisture to keep the corm plump, and the foliage fresh, but no more, or injury will ensue; it is the happy medium that must be struck, that when the plant is ready for flowering there must be no lost ground to recover, no exhausted strength to recoup, the progress must be regular, onward, easy.

The soil most recommended for the *Cyclamen* is a compost of fine loam and leaf mould, about equal parts, with sufficient silver sand to keep it free. The seed should be sown in shallow pans, well drained; sow as soon as the seed is ripe, say August or September, though some recommend waiting till November and December. Keep the pans in a temperature of 50° until the seedlings appear, when they should get as much light as possible, or they will become drawn and weakly. When ready prick them out into 5-inch pots, putting six or eight into each pot, and in spring re-pot them singly into 60 size pots. As the sun becomes more powerful they will need shade,

though still requiring all the light they can get, minus the direct beams of the sun. In June they will have made good progress, and will require shifting into larger pots, and placing in a favourable position where they can enjoy plenty of light, not sunlight, except in the early morning or afternoon, and regularity in watering, especially in the matter of overhead syringing, which is most beneficial. As the days draw in the plants will want all the light they can get, protect from early frosts, keeping the temperature to about 45°, and fresh air whenever practicable.

The earliest flowers always show the best colour, and they may be looked for as early as Christmas, but they do not come into general bloom till February and March. After blooming they will need shade, and the following summer the plants will cease to put forth fresh leaves, then less water must be given until growth is again started, and so the same plant will continue to bloom year after year, though the usual practice is to throw away the tubers after the third or fourth year, as the quality of the flowers deteriorates with age.

The characteristics of the Cyclamen which it is desirable to improve are :—

- I. The plant ; its habit ; compactness of growth ; elegance of form ; freedom in bloom.
- II. The leaves ; variegation, or strength of colour.
- III. The flower ; colour ; size ; fragrance.

The efforts of various of our well-known cultivators of this plant have been directed into different channels. Mr. Little, of Hillingdon, has striven to produce the finest colour, the deepest crimsons and purples, and his efforts have been duly recognised by this Society, who have awarded him First-Class Certificates for several of his most successful examples, as for instance, *Queen of Crimson*s, *Ruby*, *Purpleum*, *Prince of Purple*, and *Purple Gem*, which would be difficult to surpass in this his speciality—colour.

Again, Mr. Hook, of Bridgfield, is aiming at a combination of good quality blooms, with silver margined foliage, in this, so far as the foliage is concerned, Mr. Hook has succeeded in raising a strain with beautifully distinct foliage, deep green in the centre, margined with a distinctly lighter colour, but as yet there is much room for improvement in the flowers.

Mr. Edmunds, of Hayes Nursery, another persevering culti-

vator, has given his attention to size and form, and he and Mr. Williams and others have exhibited plants with flowers of great size, combined with elegant habit and fair colour, but as yet there seems to be a difficulty in raising a variety of large flowers coupled with the great freedom of bloom of the smaller varieties. Then again as to colour, none of the largest types are equal in intensity of colour to Mr. Little's best strains.

As regards the possibilities of the Cyclamen, the past few years have seen great advances, but there is much yet remaining to be accomplished which will take time and perseverance; the wonders effected by hybridisation are not always sudden in their achievement; year after year of patient crossing, each season bringing the hybridist a little nearer his desired climax; disappointment often awaits him, sometimes failure; accident may deprive him of the fruits of many years of toil. Still, it is a labour of love, and well is he repaid in the result accomplished, and the approbation of those who are eagerly watching his experiments.

An important question here arises. Does the size and vigorous habit of some plants arise invariably from a favourable combination of qualities inherited from either parent? Not always. It will be remembered what a revolution has been effected in the mode of cultivating the Cyclamen, to which I have already alluded. Under the old drying method the bloom was small, and the habit cramped. Now, however, the plants are expected to bloom the first year, the seedlings have been helped forward vigorously, there has never been the slightest check; the surroundings, soil, temperature, light, air have been regulated so as best to suit the plant's requirements, and, in consequence, fine succulent corms have been produced which have yielded the magnificent heads of stately bloom, larger and stronger than have ever before been seen, whilst astonishing profusion of bloom is achieved after a few years. Mr. Little writes to me that upon one of his plants ten years old, measuring 8 inches across, have been counted at one time as many as 300 flowers! A circumstance worthy of being recorded.

What we wish to see is a combination of the largest size coupled with the richest colour in the flowers, the compactest, neatest foliage, emarginate, zoned or otherwise, the most graceful habit, and withal the most vigorous and abundant bloom and definite fragrance. Some day doubtless all this may be combined in a single plant, but much remains to be done first, for with the size of the flower gained, freedom of bloom seems to be lost, probably on account of the

necessarily massive peduncles taking too much strength out of the roots.

Striped and spotted varieties of a permanent type have not as yet, I believe, been achieved, the variegation has been partial, not decided, and it is not by any means the same in different seasons and under different conditions; with a damp, close atmosphere, some plants will spot more readily than others. It has also been observed that some plants bloom earlier in the season than others, and this character appears to be permanently attached to them.

A few words in conclusion on the subject of the artificial fertilisation of the flowers. For this delicate operation we must first have a favourable day, not too early in the season, lest the pods damp off, which they are liable to do if the cross is effected earlier than February. A bright sunny day is best, when the pollen seems to possess more fertilising power, being doubtless affected by a more or less humid state of the atmosphere. In Nature it is doubtful if the fertilisation of *Cyclamen* is, as a rule, effected by bees or insects, for there seems to be a natural tendency on dry days for the pollen sheath to burst and scatter the minute particles in the air, where they float with the breeze, and may easily be observed if a plant be shaken in a darkened room into which a ray of sunlight is admitted, and as the smallest particle of pollen coming into contact with the stigma of the seed-bearing plant is quite sufficient to secure fertilisation, it will readily be seen that when it is desired to operate artificially, the seed-bearing plant must be moved away from all the rest, the flower should not have been more than one day open, as in spite of the utmost care insect visitors may possibly have been before you, and spoil all your nice calculations. It is undesirable to fertilise more than six or eight flowers on any one plant, the rest should be cut off so that the full vigour of the plant may be concentrated upon the seeds, and in proportion, so will they be plump and full, and afford fine vigorous young seedlings.

Finally, I must just allude to nomenclature. Numerous beautiful seedlings, the results of patient experiments, are being brought up from time to time to our spring shows, and we are delighted at their appearance, but it is a pity that botanical names should be attached to them as though they were new species. They are nearly all varieties of *C. persicum*, and it would be far better if such improved strains should receive florists' names, which are quite distinctive and do not confuse the student.

I must also acknowledge my indebtedness to Mr. Little, of Hillingdon, to Mr. Tyerman, to Mr. Atkins, and to Mr. Barr, who have afforded me much valuable information which has been incorporated in this paper.

There are still several points in connection with the specific distinctions of the genus *Cyclamen* which have yet to be satisfactorily cleared up, these may form the subject of a further communication at some future date.

XIII. On the Culture of the Fig as a Standard in the Open Air.

By COLONEL R. TREVOR CLARKE.

[Read at Society's Meeting, 5th March, 1878]

THE zone of culture for the Fig as a standard out of doors has been hitherto mostly restricted to the sea-coast, or otherwise to the more southern parts of the island, but I have long had reason to believe that it might be extended further northwards.

In order to gain some knowledge on this subject, I turned out two of the hardiest kinds—viz., the Marseilles and Brown Turkey—into the open ground, the former about five years ago, the latter two years later. Roughly stated, our geographical position may be considered as being nearly in the centre of England.

The Marseilles kind has ripened its figs regularly (thirty last year), and makes a handsome, compact little tree. The Brown Turkey has succeeded equally well.

Although I had some confidence in the experiment, I was not prepared to find that the wood ripens itself as well, or even better, than against the wall, and as regards the fruit, in good seasons there is but little difference in the periods of maturation, and in favourable ones, the crop seems neither better nor worse than that on the walls.

I have lately added several sorts from the Chiswick collection, and have purposely included several of the prolific or twice-bearing varieties. These latter do not bring to perfection either the winter or summer crop here as wall trees, but I think it not unlikely that they may hold their fruit in the open garden better than when subject to the uneven excitement of a wall. These last-named

plants are now furnished with well ripened wood, and are fully furnished with fruit buds. I think it right, however, to observe that my trees are growing in a separate small, well-sheltered wall garden.

I should not class our district as a warm one. The Myrtle requires protection, and Peach and Nectarine cultivation out of doors has long been abandoned as hopeless. Our soil is a strong red wheat loam, of good general qualities, resting on the inferior oolite formation. In many parts our subsoil is a strong clay, my trees, however, stand over the shell-bearing limestone.

I am aware that the Fig has been thus grown with much success further north, but, unless I am mistaken, it has been in maritime climates, where plants of a much tenderer constitution have been found to flourish also. In my own case I attribute my results to the steady and equable growth made by the plants, and the more complete exposure to climatic influences during the growing season. We are here, as I observed before, in the centre of England, and I should imagine that *a fortiori* in the London district the experiment of a small Fig orchard would be well worth the trial.

Our wall-trained Figs bear plentifully, and ripen well most seasons, but a strong frost in May has sometimes destroyed greater part of the young pushing fruits, while the less developed buds upon the standards have escaped uninjured.

We train closely on the walls, and keep the wood very thin, but allow the year's growth to ramble untrained till towards the end of the season. Greater part of the shoots are stopped before midsummer, and the secondary resulting shoots have time to mature themselves sufficiently to bear fruit in the succeeding year. We also use Dr. Hogg's method of pinching out terminal buds before the leaves push, particularly when we desire to secure the crop from long bare shoots previous to cutting them entirely back at the winter pruning. I have tried, too, Mr. Gilbert's method of letting the trees occasionally ramble at will for more than one season, so as to take a crop from untrained wood. This plan, which is founded upon the old-fashioned, but very general idea, that a Fig-tree should never be pruned at all, has the sanction of the above-mentioned very competent judge. The prune-not-at-all system is much in use in Devon and Dorset. I do not approve of it in its entirety, preferring upon the whole a stricter method of training.

My object, however, at present is not to go into the subject of wall-tree systems, or to criticise their respective merits, but to call attention to the fact that a wall tree upon the Devonshire system, and a standard in the open, are growing very much under the same conditions; the wall tree has a slightly warmer berth, but presents only one side or face to the light. In the standard the whole is exposed to all the benefit of climatic action—that is, to sun, wind, and rain, of which probably wind is not the least important. When a wall-trained plant is allowed to grow free, the young shoots, lengthy and pliable as they are in the case of the Fig, soon yield to the weight of foliage at their extremities, bending outwards and downwards, till at the end of the season they have taken a horizontal or even hanging condition; the last inch or two of growth being curved a little upwards from the effort to regain the natural vertical position of normal plant growth.

The tree has been in fact training itself horizontally, and the result is the production of strong, short-jointed, fruiting wood.

In conclusion, as I am merely recording an experiment, and not nursing, so to speak, a hobby, I feel bound to note everything, whether of the nature of success or of drawback. In cold unfavourable autumns the fruit of the Marseilles would drop off when ripe after a cold night or too, and, though very sweet, would be somewhat flaccid and watery. A few fine days, however, would put a stop to this. Also, a few late-growing gross shoots will fail to ripen their fruit-bearing extremities, which then perish in the winter. Three years ago, however, root-pruning checked this evil, and the process was repeated this last November.

XIV. On Fungoid Diseases of the Vine. Part III. By Dr. M. C. COOKE.

[Read at Meeting of Scientific Committee, 19th March, 1878.]

IN continuing the series of notes on the diseases of the Vine it is proposed to limit the present communication to those classed by mycologists under the genera *Phyllosticta*, *Septoria*, and their immediate allies. It may be premised that the fungi of this type are seldom really destructive in their influence, but exceptions to this

may occasionally be found. They consist of small globose perithecia, scarcely larger than the point of a pin, studded over the leaves in which they are immersed; often seated in clusters upon bleached spots, which in many cases is surrounded by a definite discoloured line or border. These small perithecia contain a large number of minute, uncoloured spores, at first produced on the tips of short delicate threads (sporophores), but soon becoming free, issuing in tendrils from a pore at the apex of the perithecium. The different genera are mainly constituted from the character of the spores. The number of species on plants of all kinds is exceedingly numerous, usually appearing, as the vigour of the leaves decline, and it is probable that the majority of the species are but conditions of some higher fungi, principally of the *Sphæriacei*. Until the species to which they belong are satisfactorily determined nothing remains for us but to treat them as autonomous fungi, and recognise them under distinctive names.

Phyllosticta vitis, Sacc. Professor Saccardo, of Padua, has proposed the limitation of the genus *Phyllosticta* to species with ovoid or oblong simple spores; that of *Septoria* to species with linear or filiform spores, and that of *Ascochyta* to oblong uniseptate spores. The species just named has been doubtfully attributed by him to Fuckel. It is uncertain whether Fuckel has ever described or published such a species. It occurs on the leaves of *Vitis vinifera*, in Italy, forming irregular bleached spots, with a brownish margin. The spores resemble those so common in the genus *Phoma*, being elliptical, about $0.006-0.007 \times 0.003$ mm., with a nucleus at each extremity. It is found in the autumn, but probably is neither common nor destructive.

Phyllosticta viticola, Sacc & Sp. Is another species which is found also on the cultivated Vine, but on less fading green leaves, forming smaller and more definite spots, which are whitish in the centre, surrounded by a broad purplish margin. In this species the perithecia are scarcely more than half the size of those in the last-named, and the spores are shorter 0.005×0.0025 mm., at length having an olivaceous tinge. Even in external appearance the two species are manifestly distinct, and may be distinguished from each other by the unaided eye. This also is an autumnal species, and there is no account of its being destructive. Under the name of *Phyllosticta vitis* a species has been attributed to Desmazieres, but of this we have no knowledge.

Septoria viticola, Berk. & Curt. This is a North American

species, so named on the faith of specimens from the late Dr. Curtis and from Mr. Ravenel, but we have failed to meet with any description. It forms brown spots on the leaves of *Vitis vinifera*, and perhaps of other species, on which the small brown perithecia are scattered; but the spores are globose with a reticulated surface, about $\cdot 01$ mm. diameter. This, then, is clearly not a species of *Septoria* or *Phyllosticta*, but belongs to the genus *Sacidium*, and will henceforth have to be known by its more accurate name of *Sacidium viticolum*. Specimens have been issued in Ravenel's "Fungi Americani" (no. 26) under the old name of *Septoria viticola*.

Septoria ampelina, Berk. & Curt. This is a true *Septoria* on the leaves of *V. vulpina*, and perhaps may be partly the *S. vitis* of Curtis's catalogue. It is described in "Grevillea" (under no. 440) by the Rev. M. J. Berkeley, and consists of brownish or pale rufous spots, in which the small and indistinct perithecia are immersed. The spores are thread-like, straight or curved, mostly containing several nuclei in a row, and measure from $\cdot 04$ to $\cdot 05$ mm. in length. This species is also issued in Ravenel's "Fungi Americani" (no. 29) from South Carolina.

Septoria vitis, Lev. Is a species described in the "Annales des Sciences Naturelles" for 1846, vol. v., p. 279. The perithecia are very minute, gregarious in blackish spots. It occurs on leaves of *V. vinifera* in the neighbourhood of Paris. By favour of the Rev. M. J. Berkeley we have seen an original specimen, the external appearance of which is certainly very distinct. The perithecia are closely packed together on the spots, which are thereby quite blackened. Species of *Septoria* after dessication are most unsatisfactory things to examine, and this is no exception; but as far as we could ascertain from the examination of a single cluster of perithecia the spores are narrowly oblong, and less than $\cdot 01$ mm. in length. Leveille describes them as curved and fusiform, without septa, but he gives no dimensions. According to the limitation of genera above alluded to this cannot now be retained in *Septoria* on account of the spores. It will therefore be relegated to *Phyllosticta*, with the name of *P. Leveillei*, C., there being already a *P. vitis*, from which this is undoubtedly distinct.

Septoria Badhami, B. & Br. Being in some doubt whether we had accurately determined this species, of which specimens were distributed in "Fungi Britannici" (series i., no. 206), the Rev. M. J. Berkeley was again appealed to, and from his authentic specimen the accuracy of our published specimens has been established.

This species was described by Messrs. Berkeley and Broome in the "Annals of Natural History" (under no. 748) in the following manner:—"Forming little brownish specks on either side of the leaf, consisting of a few subconglomerate perithecia. Spores oblong, clavate, .002 inch (or .05 mm.) long, endochrome, sometimes retracted to one end, containing a few minute granules very rarely there are one or two septa." The typical specimens unfortunately did not bear out this description, but it must be borne in mind that we were not at liberty to do more than examine a minute fragment of a borrowed specimen. Whether there are other perithecia to be found containing the large spores described by Messrs. Berkeley and Broome, it is impossible to affirm or deny; all that we discovered was a great profusion of very minute, almost linear, spores, exactly like those of the specimens in "Fungi Britannici," no. 206, not more than .006 mm. long, whereas those figured in the "Annals" were stated to be nearly ten times as long. It is impossible to explain this contradiction, except on the hypothesis that there are perithecia mixed with, and undistinguishable from, the rest containing different fruit. In our own specimens collected at Shere and at Highgate, we were never able to find any other than the minute spores which occurred in profusion also in the typical specimens. Neither form of spores belong to *Septoria* as now limited. Those which we have found, and to which our published specimens belong, would now be called *Phyllosticta Badhami*, C., whereas the description in the "Annals," but not the specimen, as far as we could discover, belongs to the genus *Ascochyta*. Accepting the limits of these genera as defined by Professor Saccardo in this investigation, we examined the specimens published by Dr. Rabenhorst (no. 852), under the name of *Septoria Badhami* var. *Fraxini*, on ash leaves, and we were surprised to find it was not a *Septoria* at all, but a species of mould (*Dematiei*) in dense tufts, without any kind of a perithecium, and closely resembling *Passalora bacilligera*, Mont., with long, lanceolate, uniseptate spores, one cell much broader than the other.

Septoria falx, Berk. & Curt. There is still another species of *Septoria* on Vine found in North America, but in this instance inhabiting the twigs, to which the above name is given. It is described in "Grevillea" (vol. iii., p. 11) as consisting of rather large erumpent perithecia, containing filiform spores, seated on pedicels of equal length and resembling when *in situ* a reaping-hook. This is a species which has never come under our notice.

Baron Thuemen, in his enumeration of the Fungi of the Vine in Austria, does not mention a single species of this group as occurring on *V. vinifera*, and only *Septoria viticola*, B. & C. (our *Sacidium viticolum*), on leaves of the American Vine.

Ascochyta ampelina, Sacc. This species is described by Saccardo in "Michelia," part ii., p. 168, and Professor Saccardo has also favoured us with specimens and drawings. It forms small whitish spots on the leaves, and also on the twigs of *V. vinifera* in Italy. The spots are surrounded by a broad purplish-brown margin, and the perithecia are nearly of the same size as those of *Phyllosticta vitis*, the spores are almost fusiform, rather obtuse at the extremities and uniseptate $\cdot 01\text{--}\cdot 012 \times \cdot 003\text{--}\cdot 0035$ mm., acquiring an olivaceous tinge. When this species occurs on the twigs the perithecia attain nearly double the dimensions of those on the leaves, and the spores also are somewhat larger ($\cdot 015 \times \cdot 003$ mm). At present it has not been recorded out of Italy.

Ascochyta rufomaculans, Berk. This was described and figured by the Rev. M. J. Berkeley, in the *Gardener's Chronicle* for 1854, (p. 676), under the name of *Septoria rufo maculans*. It was said to form orbicular spots of a sienna-brown, preserving constantly a definite outline upon the berries and not upon the leaves. The spot separates readily from the subjacent pulp, in consequence of a copious crop of mycelium, the threads of which form radii of a circle. The surface is rough with little raised orbicular reddish perithecia arranged concentrically. The spores vary in size from $\cdot 02$ mm. in length. In age the perithecia fall away leaving a little aperture, the border of which is often stained black.

XV.—Fern Sports. By T. MOORE, F.L.S., Curator of the Chelsea Botanic Garden.

THE number of Fern sports now known in our gardens is amazing, and though a considerable proportion of them have been produced under the hand of the cultivator, yet a very large number have been found in natural habitats, and have been produced in what would be called a "wild" condition. This is especially true of British Ferns, which are probably better known than those of most other countries owing to the extensive taste for them which exists

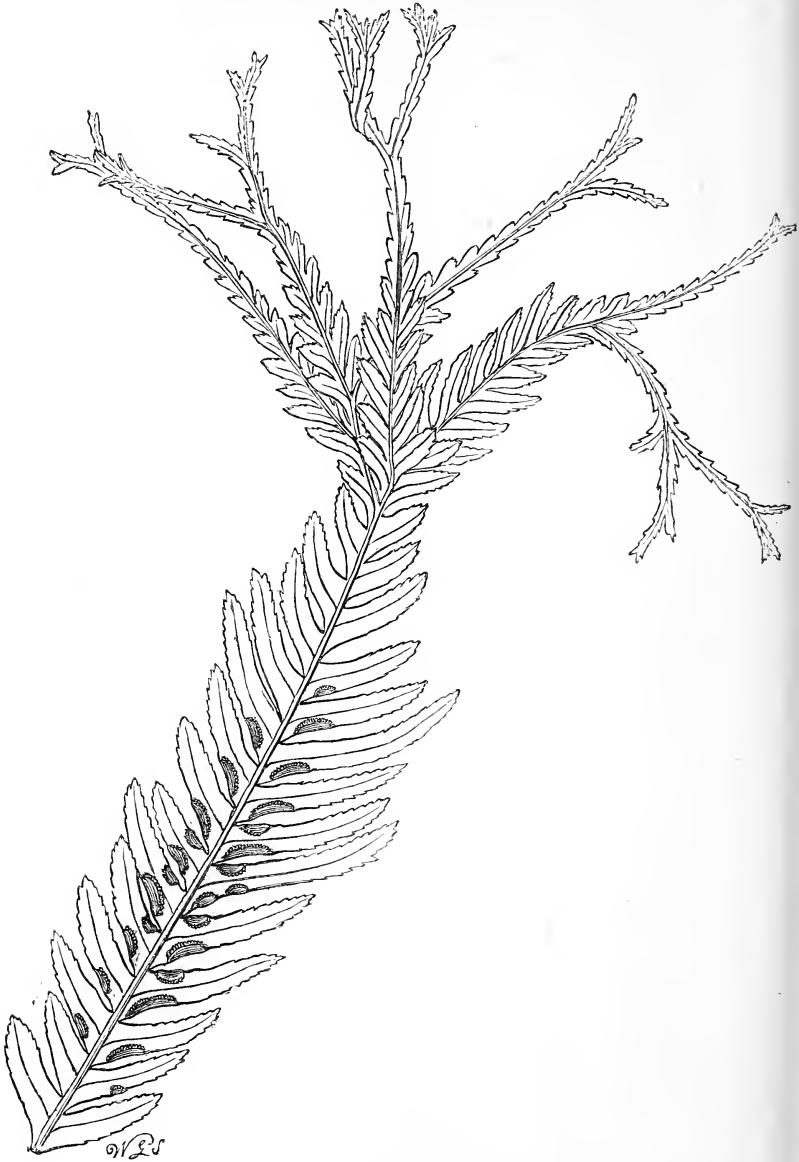
and persists amongst us. Whether or not this amount of variation is owing to our insular climate, as some botanists suppose, the fact remains, and some recent experience rather goes to confirm the supposition. The Messrs. Stansfield and Son, of Todmorden, recently sent me fronds of several abnormal forms of a well-known North African species which they had received from the Azores, namely, *Pteris arguta*, and these, with a few other curious forms from other sources, were recently exhibited at a meeting of the Scientific Committee. The most remarkable of the variations are the following :—

Pteris arguta majuscula (M.).—Fronds normally leafy, pentagonal, pedately-bipinnate, the lower pinnæ with a strongly developed semi-decurrent pinna on the posterior side; apex of the frond much elongated, the segments very large, those of the main rachis 2 inches, those of the basal pinnæ $1\frac{1}{2}$ inch long; pinnules bluntish, slightly serrate, soriferous towards the base; apices of the pinnæ caudate. This form is chiefly remarkable for the large size of the segments, and the caudate apices of the pinnæ.

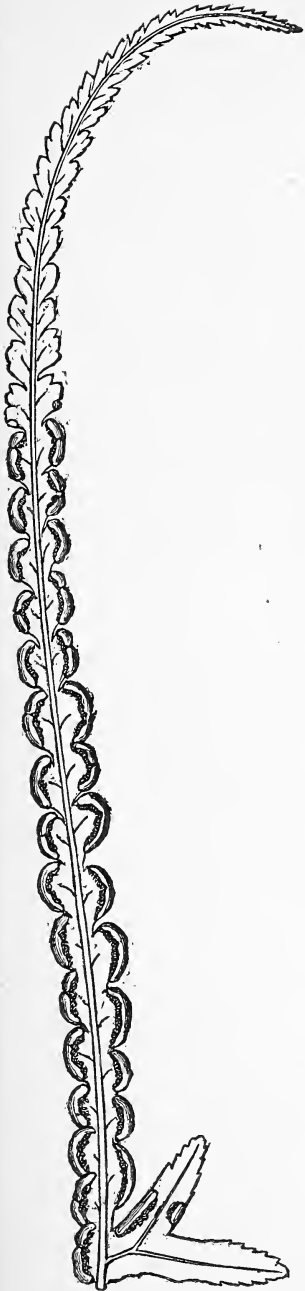
Pteris arguta acuminatissima (M.).—The fronds of this very characteristic form, which are normally leafy, are smaller than in the preceding; they are about 1 foot long, pentangular, pedately-bipinnate; the pinnules are rather distant, about an inch long, linear or oblong falcate, tapered to a very sharp point, and occasionally drawn out to a very narrow point, as are all the pinnæ; apical pinnules depauperated, so that the pinnæ terminate in a long slender tail-like apex.

Pteris arguta polydactyla (M.).—Fronds normally leafy, pentangular, pedately-bipinnate; the pinnules are oblong or oblong-falcate, with serrated edges; apices of the pinnæ two, three, or more times divided into slender tapering very much divaricate lobes, which form a many-fingered margin to the frond. Of spreading habit, and of very ornamental character, the furcation of the tips of the lobes being well marked.

Pteris arguta rotundata (M.).—Fronds symmetrically depauperated, pedately-bipinnate, pentangular, 2 feet high or more; pinnæ in the lower half of the frond, with one or two larger pinnules developed on the posterior side, on the upper half and in the apical parts of the lower pinnæ reduced to roundish or flabellate lobes, bearing sori along the rounded edge. This is a most remarkable form, the pinnules being almost entirely reduced to roundish lobes such as appear in the curious variety of Lady Fern, *Athyrium*



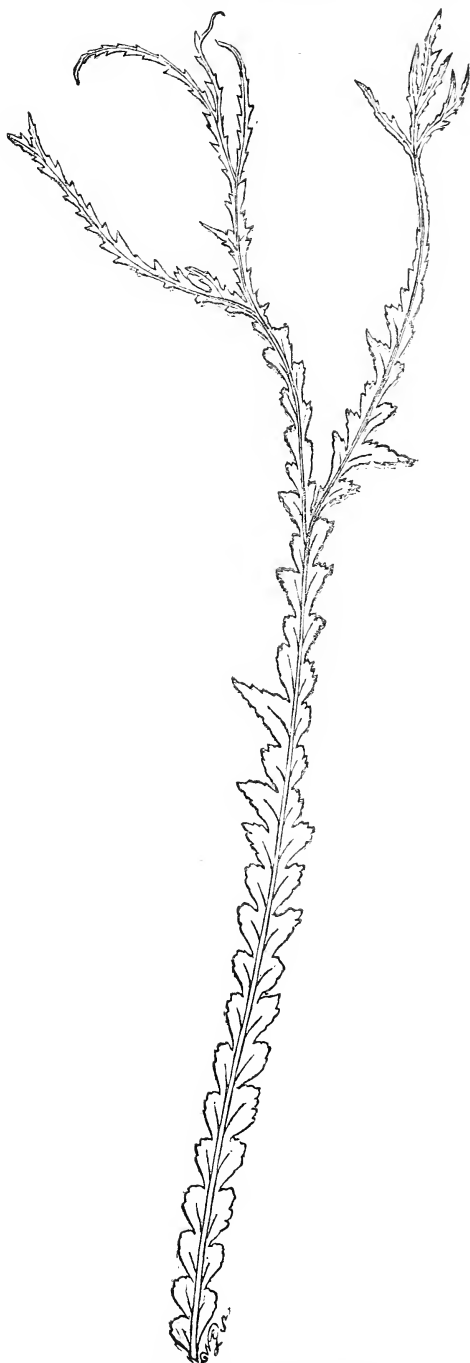
PTERIS ARGUTA POLYDACTYLA.



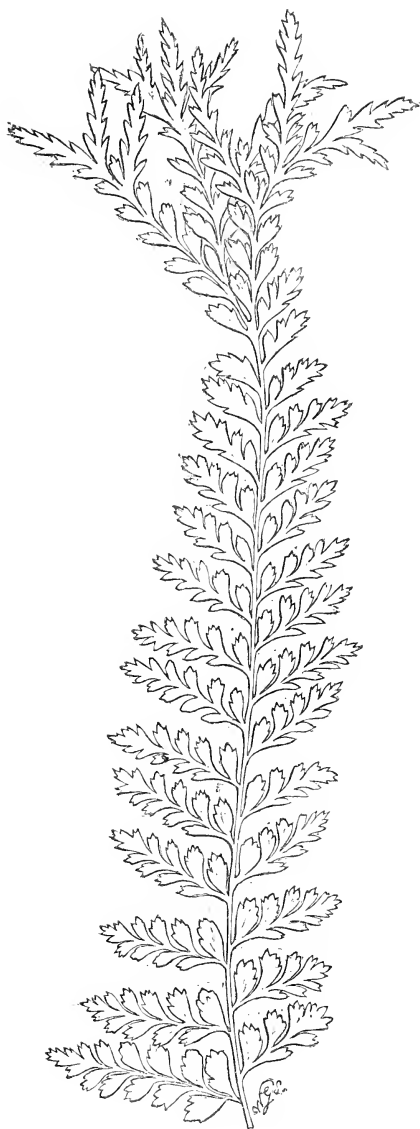
Filix-fœmina Frizellæ, found in Ireland some years ago by Miss Frizell. The few linear-oblong acute pinnæ which occur on the lower pinnæ alone serve for the specific identification of the plant, which is of a very distinct and ornamental character.

Pteris arguta Stansfieldii (M).—Fronds symmetrically depauperated, 2 feet high, loosely bipinnate, with a pedate base, triangular, the pinnæ narrow and distinct; pinnules mostly reduced to short subrotund lobes slightly toothed at the tip, or with a short projected toothed apex, here and there developed into lobes, of which a few are nearly or quite normal; apices variously divided into long narrow forked divisions, which are very unequally developed, something in the way of *Athyrium Filix-fœmina furcellatum*. There are two slightly differing forms of this, the one more furcate than the other, but probably, when reproduced from spores, they will become merged in one.

Another illustration of the sportive character of Ferns—and this also an island plant recently imported from the South Seas by several of our principal nurserymen, and which has been exhibited and certificated at some of the recent meetings of the Society—is found in the beautifully-crested *Microlepia hirta cristata* (M). This novelty has the fronds of a rich deep green colour, broadly ovate, tripinnate, 2—4 feet long, gracefully pendent; the pinnæ



PTERIS ARGUTA STANSFIELDII.



MICROLEPIA HIRTA CRISTATA.

lanceolate-oblong, broad at the base, somewhat narrowed near the apex, which is multifidly-forked, forming a terminal tassel of finely divided segments; the pinnules linear-oblong, obtuse, about an inch long, divided into several obovate decurrent segments; the rachis densely hairy, and the apex of the frond cristate-multifid. This will be a very useful ornamental evergreen Fern, being free in growth and graceful in habit. The spreading or arching fronds are of herbaceous texture, and the drooping tassels which hang from the apex of the frond itself, and from the ends of all the pinnæ, give it a very pleasing contour, so that it is well adapted both for pot culture and also for suspending overhead in baskets. It is, moreover, one of those Ferns which can be grown rapidly into an effective size.

Other recent introductions which bear out the same idea of insular variation occur in the genus *Nephrolepis*, of which *N. davallioides furcans* (more intimate acquaintance with which rather indicates its being a variety of *N. exaltata* than *N. davallioides*, to which it was at first referred), which has forked pinnæ, is from the South Sea Islands; and *N. Duffii*, which has the pinnæ dwarfed and developed in pairs, is from the Duke of York's Island.

XVI. REPORT on Filberts Grown in the Royal Horticultural Society's Garden, Chiswick. By A. F. BARRON.

FILBERTS have generally been divided into two Classes, viz.:—

1. *Filberts*.—Long-bearded—*i.e.*, having the husks longer than the nuts.

2. *Nuts*.—Short-bearded—*i.e.*, having the husks shorter than the nuts. *These distinctions, however, cannot be maintained.*

Popularly they are pretty correctly classed as follow:—

1. FILBERTS.—Varieties of oblong shape like that of the finger nails, and generally remaining in the husks:—

Bond; Barrs' Espagnole; Barcelone de Loddiges; Cosford; A Grappes; A Grappes précoce; Frizzled; Lambert's Hartington Prolific; Lichtenstein's Zellernuss; Siegel's Zellernuss; Red Filbert; White Filbert.

2. COBS.—Varieties of short broad shape like that of the

thumbnail, rather large, and with thick shells; generally falling freely from the husk:—

Atlas; *Merveille de Bolwiller*;
Burchardt's; *Weismann's Zellernuss*.

3. NUTS.—All the smaller varieties; without husks:—

Aveline de Provence; *Corylus arborescens*;
Corylus laciniatus; à *Fruits striées*;
Small Cluster; *St. Grisier*;

I. ATLAS.

Synonyms.—Downton; *Corylus Algeriensis*.

Husk hairy, about equal in length to the nut, generally divided into two parts; deeply toothed, and pressing closely to the nut; of a dark brown colour. Nut large, broad, angular, with a broad irregular base, parting freely from the husk when ripe; shell dark brown, very thick and hard; kernel large; full and of excellent quality. Plant of strong growth; fruits freely; ripe mid-season.

A splendid nut of the Cob Class.

Aveline de Provence.

Husk hairy, a little longer than the nut, light coloured; sharply but not deeply toothed. Nut short, pointed, with a rather broad base, of a light grey colour, and parting freely from the husk when ripe; shell very thick and hard; kernel full. Plant of moderate growth; a great cropper, but late in ripening.

This appears to be the same as the light coloured variety of the Barcelona Nuts of commerce.

Aveline Rouge.

See *Red Filbert*.

Barcelone Blanc.

See *White Filbert*.

Barcelone de Loddiges.

Husk very large, full, covered with short hairs, twice the length of the nut, which in some cases it completely covers; sharply serrated, light coloured. Nut of medium size, being almost hidden in the large husk, angular, bluntly pointed at both

ends, dark coloured; shell very thick, hard; kernel full. Grows in clusters of five or six. Plant of very robust growth, with large dark green leaves; a moderate cropper; fruit ripens early.

Very distinct, but too small.

Barr's Espagnole.

Husk downy, short, about two-thirds the length of the nut, which it presses closely; deeply and irregularly toothed, of a dull grey colour. Nut much exposed, short, having a broad base, and tapering very nearly to the apex; shell downy, but very hard, of a dull grey colour. Grows in clusters of from four to six. Plant of medium growth; moderate cropper; ripens late.

Burr or Barn.

Not fruited.

Bizarre.

Not fruited.

Bond.

Husk downy, about one-third longer than the nut; very deeply toothed, the segments very long and narrow. Nut exposed, medium size, ovate, light coloured, very soft and downy; shell soft, may be pierced with the thumbnail; kernel small. Grows in clusters of from four to six. Plant of slender growth; mid-season; prolific; does not keep well.

Cape Nut.

See *Frizzled Filbert*.

Burchardt's.

Husk downy, a little longer than the nut, deeply toothed, dark coloured. Nut medium sized, very broad, the breadth exceeding the height, angular, or nearly square, with a broad flat base, light coloured; shell thick; kernel very large, full, of excellent flavour. Plant of moderate growth; late growing; fruit ripens early.

Corylus laciniatus.

Husk very small, lacinated to the very base, and much reflexed. Nut quite exposed, small, short, somewhat flattened, but of even regular form, of a pale grey colour; shell very thick and

hard. Grows in clusters of from three to five. Plant of slender growth; leaves deeply cut or lacinated; fruits freely.

This appears to be merely a cut leaved variety of the ordinary Hazel (*Corylus avellana*). Ornamental.

Corylus algeriensis.

See *Atlas*.

Corylus arborescens.

Husk small, downy, about the same length as the nut, lacinated to nearly the base; the segments long, linear, and reflexed. Nut small, does not part freely from the husk, flattened and broadly pointed, light coloured; shell very thick and hard; kernel full. Grows in clusters of five or six. Plant of moderate growth. A worthless variety.

Cosford.

Synonyms.—Miss Young's; 'Thin-shelled.

Husk downy, about equal in length to the nut, very close fitting; toothed, light coloured. Nut large, oblong, rounded, remaining in the husk; of a warm light colour; shell very thin, may be easily broken between the thumb and fingers; kernel large, full, of excellent quality. Grows in clusters of from three to five. Plant of moderate growth; leaves pale green; fruits freely; ripe mid-season. One of the finest Filberts in cultivation.

Downton.

See *Atlas*.

Downton Large Square.

See *Atlas*.

Franche rouge.

See *Red Filbert*.

Frizzled.

Synonym.—Cape Nut.

Husk large, downy, somewhat exceeding the length of the nut, pale or dull coloured; deeply lacinated or toothed, and reflexed to one-half its length, giving it a frilled or frizzled appearance, and thus exposing the nut. Nut oblong, from 1 to 1½ inches, somewhat

flattened and broadly pointed ; shell pale, thick ; kernel large full, of fine flavour. Grows in clusters of four or five. Plant of moderate growth ; free fruiting ; late in ripening. A very pretty and distinct variety.

A Fruits striées.

Husk downy, longer than nut ; deeply toothed or lacinated, and opening away or reflexing, thus exposing the nut when ripening. Nut small, long, and narrow, with a flat point ; base irregular, pointed, lightly coloured ; shell thin, hard. Grows in clusters of three to six. Plant moderately robust ; grows late ; free fruiting ; ripens early. A very pretty nut, but too small.

A Grappes.

Husk hairy, about the same length as the nut, in two parts, which spread out from the nut as it approaches ripeness ; sharply serrated. Nut quite exposed, small, long, flattened, spoon shaped, light coloured ; shell thick and hard ; kernel full. Grows in clusters of from five to eight ; strong grower ; ripens late.

A Grappes précoce.

Husk large, very downy, about the same length as the nut ; very deeply toothed and partly reflexed. Nut small, long, narrow, and gradually flattened towards the apex like a wedge ; shell downy, pale grey, thin. Grows in clusters of from six to eight. Plant of slender growth ; prolific ; early.

Grosse précoce de Frauendorf.

See *Red Filbert*.

Grosse ronde de Piedmont.

See *White Filbert*.

A Gros Fruits Noir.

Husk very dark coloured, hairy, nearly as long as the nut, in two divisions, fitting very close to the nut, thereby giving it a bare appearance. Nut of medium size, long ; the base narrow, widening to the apex, dark or dull coloured ; shell very thick ; kernel small ; a moderate grower ; prolific ; does not ripen well.

Hartington Prolific.

Husk hairy, one-third longer than nut; the extending portion deeply lacinated and reflexed. Nut small, long, narrow, and pointed at both ends, irregular, light coloured; shell thin; kernel full; fine flavour. Grows in clusters of six or seven. Plant of moderate growth; very prolific and very early. The earliest nut to ripen, but too small.

Jeeves' Seedling.

See *Siegel's Zellernuss*.

Kentish Cob.

See *Lambert's Filbert*.

Knight's Small.

See *White Filbert*.

Lambert's Filbert.

Synonyms.—Kentish Cob; Filbert Cob; Spanische Nut.

Husk downy, large, about one-third longer than the nut, close fitting, and over the apex, of which it is occasionally contracted so as to enclose the nut; very slightly toothed; dull coloured. Nut large, remaining in the husk; oblong, pointed; somewhat furrowed and irregular, of a dull grey colour; shell thick; kernel full. Grows in clusters of five or six. Plant of medium growth; a very great and certain cropper; fruit ripens mid-season. One of the very best Filberts in cultivation; very largely grown in Kent under the name of Kentish Cob.

Lichtenstein's Zellernuss.

Husk downy, large, a little longer than the nut; bluntly toothed, the segments slightly reflexed. Nut medium size, long, pointed at both ends, of irregular angular shape, and nearly closed in by the husk, of a dull grey colour; shell very hard. Grows in small clusters. Plant of strong, late growth; ripens late.

2.

Miss Young's.

See *Cosford*.

Merveille de Bolwiller.

Husk downy; about one-third longer than the nut in two divisions; deeply and irregularly toothed, and pressing closely to the nut. Nut large, rounded at base; very broad, the breadth nearly equal to the height, tapering to a broad point; very regular and uniform; light coloured; shell thick; kernel large; fine flavour. Plant of strong growth; grows late; prolific; fruit ripens mid-season. A very handsome and excellent variety.

Purple Leaved.

This is merely a purple-leaved variety of the *Red Filbert*. A very ornamental plant.

Red Filbert.

Synonyms.—Aveline rouge, Franche rouge, Rouge d'Algiers, Grosse précoce de Frauendorf.

Husk downy, of a reddish brown colour, nearly twice the length of the nut, round the apex of which it is contracted, thereby enclosing the nut. Nut remaining in the husk small, long, and pointed at both ends; shell thin but hard; kernel very full, having a red skin; finely flavoured. Plant of slender growth; very free fruiting; ripe mid-season. A very excellent variety.

Rouge d'Algiers.

See *Red Filbert*.

Small Cluster.

Husk small, hairy, deeply divided into two parts of about the same length as the nut; toothed, and pressing closely to the nut. Nut small, short, with a broad-pointed base; light coloured; shell thin but hard; kernel full. Grows in clusters of from eight to ten; slender growing; prolific, but too small. Worthless.

Siegel's Zellernuss.

Synonyms.—Sickler's Zellernuss; Jeeves' Seedling.

Husk, downy short, extending to three-quarters of the length of the nut; very deeply toothed and reflexed, the nut thereby being almost entirely exposed. Nut large, oblong, with a broad rounded base, becoming flattened towards the apex, light

coloured; shell thin; kernel large, full. Grows in small clusters; moderate grower; ripe mid-season.

Spanish Nut.

See *Lambert's*.

St. Grisier.

Husk downy, or having only short hairs; a little longer than the nut, which it presses closely; sharply toothed. Nut of medium size, short, roundish, with a broad base; of a dark brown or reddish colour; shell thick, but easily broken; kernel large, full, of excellent flavour. Grows in clusters of three to six. Plant of slender growth; very prolific; ripens early.

This appears to be the same as the reddish coloured Barcelona nut of commerce; perhaps the finest flavoured of all nuts.

Weismann's Zellerenus.

This is very similar to *Merveille de Bolwiller*, but larger.

White Filbert.

Synonyms.—Knight's Small; Barcelone Blanc; Grosse ronde de Piedmont.

Husk hairy, light coloured; nearly twice the length of the nut, round the apex of which it is contracted, thereby enclosing it. It frequently bursts a little on one side, whereby the nut is exposed. Nut long, small, remaining in the husk, pointed at both ends; shell thin, very firm; kernel large full, of fine quality. Grows in clusters of from five to eight. Plant of slender growth; a very heavy and certain cropper; fruit ripens mid-season.

A very excellent and useful variety.

LIST OF SELECT NUTS FOR GENERAL CULTIVATION.

<i>Atlas;</i>	<i>Merveille de Bolwiller;</i>
<i>Cosford;</i>	<i>Siegel's Zellernuss;</i>
<i>Lambert's;</i>	<i>White Filbert.</i>

XVII. REPORT on Savoys Grown at Chiswick by the Fruit and Vegetable Committee, 1877. By A. F. BARRON.

THE SAVOY—*Brassica oleracea bullata major*.—A species of Cabbage, distinguished by having the leaves blistered or curled. It is the *Chou de Milan* of the French, but differs from the *Chou de Milan* of the English.

A collection of all the known varieties was secured from the following seedsmen, &c., viz.:—Messrs. Ernest Benary, Carter & Co., Dippé Bros., Harrison & Sons, André Leroy, Minier & Co., Nutting & Sons, Stuart & Mein, Vilmorin et Cie., Veitch & Sons, and Wheeler & Son, representing 53 distinct names. These on examination by the committee were arranged into 3 classes as follows:—

I. EARLY OR AUTUMN SAVOYS.

Early Dwarf Vienna.	Tom Thumb.
Early Joulin.	Tours.
King Koffee.	Ulm.
Little Pixie.	Vienna.

II. SECOND EARLY OR MID-SEASON.

Dwarf Green Curled.	Golden Yellow.
Dwarf Early.	Green Globe.
Golden Savoy.	Large Green Curled.
Golden Globe.	Sugar Loaf.

III. LATE OR WINTER.

Cape.	De Pontoise
Drumhead.	Impériale.
Des Vertus.	Limay.
Norwegian.	

And the following

BASTARD VARIETIES.

Chou de Milan Suisse	Feather Stemmed.
Sprouting Ulm.	

The varieties named being considered distinct are here de-

scribed, and correct photographs of most of them have been secured for future comparison.

The variation in appearance of different stocks of the same variety was in some cases very remarkable, and where very decided these have been given as distinct. But very few of the stocks received were so pure but that more than one variety could have been selected. The classification arrived at was determined by the average appearance.

Cape (Nutting and Sons ; Carter & Co.).

Plant of spreading habit, from 14 to 16 inches high, and from 2 to 2½ feet in diameter, with a short stem. Leaves rather small for size of plant, of a bluish-green colour, faintly tinged with brown on the outer edges, coarsely curled and leathery. Heart roundish, from 6 to 7 inches in diameter, very firm and solid. A late and very hardy sort, but of coarse and inferior quality.

Du Cap (Vilmorin et Cie.).

A very curled variety of the preceding.

Chou de Milan Suisse (Carter & Co.).

This is properly a Borecole of strong growth, forming no heart ; leaves somewhat curled like the Savoy, very hardy, and useful in severe winters.

Court Hâtif (Vilmorin et Cie.).

Plant dwarf, height 10 inches, the heads almost resting on the ground, diameter from 22 to 24 inches. Leaves large, spreading, rounded, of a light green colour, very curled near to the heart ; hearts of medium size, flattened, from 6 to 8 inches in diameter ; tolerably firm and solid, of a pale green colour. A very early sort of the mid-season section, but soon decays. Inferior.

Common Savoy (Carter & Co.).

See *Green Globe*.

Chou très friés du Cap (Leroy).

See *Cape*.

De Pontoise (Vilmorin et Cie.).

Similar to the *Vertus*, but much coarser and hardier.

Dwarf Ulm.

See *Ulm*.

Dwarf Early Drumhead.

See *Court Hâtif*.

Dwarf Green Curled.

Plant from 12 to 14 inches high, with a short stem, and a diameter of 24 inches. Leaves spreading, of medium size, finely curled throughout, of a pale green colour. Hearts rounded, at times a little pointed, from 6 to 8 inches in diameter, solid, very finely curled, and of a beautiful light green colour. An exceedingly pretty Savoy, and stands the winter well. The best variety for general use.

Des Vertus.

Plant almost resting on the ground, from 12 to 15 inches high, and from $2\frac{1}{2}$ to 3 feet across. Leaves spreading, large, rounded, of a light glaucous green colour, coarsely curled. Heads flattened, from 10 to 11 inches in diameter, very firm and solid, of a light green colour, the outer edges of the leaves tinged with brown. This variety hearts early, growing frequently to a large size, and having few outer leaves, does not stand severe frost so well as the ordinary *Drumhead*. Fine quality.

Drumhead.

Plant almost resting on the ground, from 14 to 15 inches high, and from 2 to $2\frac{1}{2}$ feet in diameter. Leaves large, broad, spreading, coarsely and slightly curled, of a deep green colour, with faint tinges of brown on some. Hearts large, from 8 to 10 or 12 inches in diameter, not much curled, very firm and solid. A very fine Savoy for winter use; very hardy.

Drumhead (Veitch).

A very curled selection of finer quality, but not so hardy as the ordinary form.

Dwarf Drumhead.

See *Drumhead*.

Early Dwarf Ulm (Dippé Bros.).

See *Ulm*.

Early Dwarf Vienna.

See *Vienna* (Stuart & Mein).

Early Dwarf Vienna (Benary).

Plant of very small, close, compact growth, smaller than the *Ulm*, with very finely curled leaves, of a very pale green colour. Hearts small, roundish ovate, from 3 to 4 inches in diameter, very close and firm, fleshy, crisp, and tender. Comes early into use. This is the finest and most curled variety of any.

Earliest Smallest Vienna (Benary).

See *Little Pixie*.

Early Joulin (Vilmorin et Cie.).

Plant small, of close, compact growth; height from 9 to 12 inches, with a short stem, and from 20 to 24 inches in diameter. Leaves of a very deep green colour, and very coarsely curled, giving it a very distinct appearance. Hearts small, roundish ovate, much but coarsely curled, very firm and solid, crisp and fleshy. Comes early into use. Inferior.

Early Limay.

See *Limay*.

Early Vienna.

See *Vienna*.

Feather Stemmed (Carter & Co.).

Plant partaking of the character of Brussels Sprouts, the stem being covered with half open sprouts, and having a small head, like a Savoy. Leaves much curled. Worthless.

Green Curled (Nutting & Sons).

See *Dwarf Green Curled*.

Green Globe (Vilmorin et Cie.).

Plant of low spreading growth, height 12 inches, with a diameter of 24 inches. Leaves roundish, rather coarsely curled, of a dark green colour. Hearts roundish or flattened, from 7 to 8 inches in diameter, very firm and solid. A mid-season variety. Good stock.

Golden Savoy (Vilmorin et Cie.).

Plant from 20 to 24 inches high, and from 2 to 3 feet in diameter, somewhat spreading. The outer leaves pale green, much curled. The hearts large, rather loose, conical, about 7 inches in diameter, of a deep golden colour; very handsome and ornamental, of excellent quality.

Golden Globe (Nutting; Carter; Minier & Co.).

A dwarfer form of the preceding, forming round and more solid hearts.

Golden Yellow (Benary).

A very fine dwarf form of the preceding. Leaves finely curled. Hearts roundish ovate, about 6 inches in diameter; very firm and solid, of a beautiful golden yellow. This variety hearts early, and then opens out in mild weather, becoming very ornamental.

Impériale (Carter & Co.).

See *Des Vertus*.

King Koffee (Harrison and Sons).

A very finely curled selection of the *Vienna*. Larger than the *Early Dwarf Vienna* of Benary.

Large Vertus Drumhead (Vilmorin et Cie.).

See *Des Vertus*.

Large Green Curled (Minier & Co.).

Plant from 17 to 18 inches high, with a stem of about 6 inches. Hearts somewhat conical in shape, about 6 inches in diameter, moderately firm and solid, and finely curled. This may be termed a tall growing variety of the *Dwarf Green Curled*, and inferior.

Large Late Erfurt (Benary).

See *Green Globe*.

Large Late Vertus Drumhead (Vilmorin et Cie.).

See *Des Vertus*.

Large Verriers (Vilmorin et Cie.).

A large and very fine variety of *Des Vertus*.

Large Curled (Carter & Co.).

See *Des Vertus*.

Large Vertus (Vilmorin et Cie.).

See *Des Vertus*.

Little Pixie (Carter & Co.).

A small and very finely curled selection of the *Vienna*, distinct and good.

Late Curled (Carter & Co.).

See *De Pontoise*.

Long Headed (Vilmorin et Cie.).

See *Sugarloaf*.

Limay (Vilmorin et Cie.).

Plant very distinct in character; height from 10 to 12 inches, with a short stem, and diameter of from 18 to 20 inches. Leaves small spreading, very closely curled, of an intensely deep green colour. Hearts very small or almost open, resembling a Borecole. If sown late it is a variety that stands the winter well. Rather coarse in quality.

Norwegian (Vilmorin et Cie.).

Plant spreading from 16 to 18 inches high, with a short stem, and from $2\frac{1}{2}$ to 3 feet in diameter. Leaves large, strong, leathery, and coarsely curled; of a bronzy-green colour, partaking to that of the Red Cabbage. Hearts roundish, about 8 inches in diameter; exceedingly firm and solid. A very pretty Savoy, very hardy, and is not injured in the severest seasons.

Pancalier Joulin (Vilmorin et Cie.).

See *Early Joulin*.

Small Early Ulm (Vilmorin).

See *Ulm*.

Small Fine Curled Limay (Carter & Co.).

See *Limay*.

Sprouting Ulm (Carter & Co.).

Plant from 15 to 18 inches high, producing a small head resembling the *Ulm*; stem covered with small sprouts resembling miniature Savoy. Peculiar, but not a desirable variety.

Sugarloaf (Nutting and Sons).

Plant from 17 to 18 inches high on a short stem, and from 14 to 15 inches in diameter. Leaves long pointed, of somewhat erect growth, and coarsely curled; of a shining glossy green colour. Hearts of large conical form, about 10 inches high, and from 4 to 6 inches in diameter. They never become very solid, and soon open up in mild weather. Rather tender; mid-season.

A Tête Longue (Carter & Co.).

See *Sugarloaf*.

Tours (Vilmorin et Cie.).

This is a much improved selection of the *Early Joulin*. Plant very dwarf, having scarcely any stem, almost resting on the ground; the outer leaves are large, broad, coarsely curled, of a dark green colour. Hearts roundish, flattened, from 5 to 6 inches in diameter, dark green, very closely curled, solid, and of good substance. A very pretty and distinct Savoy. Early, and stands frost well.

Tom Thumb (Sutton and Sons).

A very small compact growing Savoy of the *Early Joulin* type. Hearts small, very solid, and of excellent quality.

Ulm.

Plant of small close compact growth; height from 9 to 10 inches, with a short stem, about 20 inches in diameter. Leaves light green, the outer nearly plain, becoming more and more curled

the nearer to the heart, and of a paler colour. Hearts small, of a roundish oval shape, from 4 to 5 inches in diameter, very firm and solid, yet crisp, fleshy, and tender. This variety forms hearts very early in autumn, and is early fit for use. In mild weather they soon burst and open out. Excellent for early autumn use, but not sufficiently hardy for winter.

The stocks of the *Ulm Savoy* vary exceedingly.

Vienna (Stuart and Mein).

Plant resembling the *Ulm*. Leaves very plain, or but slightly curled. Hearts of medium size, roundish, very firm and solid. A very early sort, but not sufficiently curled to be valued as a Savoy.

Victoria (Stuart & Mein) (Vilmorin) (Carter & C.).

See *Dwarf Green Curled*.

Victoria Very Curled.

See *Victoria*.

Yellow Savoy (Veitch).

See *Golden Globe*.

XVIII.—On Fungoid Diseases of the Vine. Part IV.

By DR. M. C. COOKE.

[Read at Meeting of Scientific Committee, 16th April, 1878.]

WHEN it was first proposed to submit to the Committee a series of short communications on this subject there was no summary, not even a list at all complete, of the Fungi affecting the Vine. Since the last of these papers was read we have received information of the publication of two elaborate monographs—one in Italy, the other in Austria—on Vine Fungi. The Austrian monograph, by Baron Thuemen, contains in all 224 species, and forms an octavo volume of upwards of 200 pages. It must not be taken for granted that all the species which the Baron has enumerated in order to swell his work and its importance

really deserve such an honour. In this category must be placed such universal fungi as *Cladosporium herbarum*, *Aspergillus glaucus*, *Eurotium herbariorum*, and several others. If such species also as *Merulius corium*, *Lycoperdon giganteum*, *Agaricus melleus*, &c., are excluded there will still remain at least 150 species of Vine Fungi. Then again the number of these may be considerably diminished by excluding those which manifestly can have no influence on growing vines, since these fungi only make their appearance upon dead and decaying stems. For horticultural purposes only veritable Vine diseases, in the strict acceptation of the word, possess any interest, and to these our observations must be chiefly confined. Perhaps now, with two monographs in existence, there will be less excuse than ever for exceeding such a limit, and it may be worthy of consideration whether it is advisable to continue these communications under the new circumstances.

Capnodium elongatum, B. and D.—This is one of the species omitted in the Austrian monograph, and probably also in the Italian. It nevertheless has been sent to us from the Department of Agriculture for the United States as having made its appearance on Vines and Fig trees to their detriment. In one of the early volumes of the Journal of this Society the Rev. M. J. Berkeley contributed a valuable paper “On some Moulds referred by Authors to *Fumago*,” and in the course of this communication he demonstrated that the so-called species of *Fumago*, although at first appearing as a *Cladosporium*, afterwards became mixed with *Macrosporium* and other forms, and ultimately developed the elongated peculiar perithecia of *Capnodium*. The older authors confounded together under the name of *Cladosporium fumago* or *Fumago vagans* several distinct species of *Capnodium*, which were first separated and characterised in that paper. Undoubtedly *Capnodium elongatum* is one of the mature and complete conditions of *Cladosporium fumago*.

These fungi cover the living leaves and young twigs with a thick black velvety or sooty stratum often seen in an imperfect and modified condition on the leaves of the Lime, and is found more perfectly developed on Orange, Willow, and now on Vine and Fig. These parasites consist of a dense mycelium of moniliform threads, usually brown, and from these arise large elongated, sometimes branched, perithecia, which contain the sporidia. The details of structure and development are so admirably set forth in the paper already alluded to that they need not be repeated here, except to

say that the perithecia are very long, often curved and branched, narrowed upwards, terminating at the apex in a fringed orifice, and that the sporidia are triseptate and ultimately brown.

In the specimens on Vine leaves we also found other smaller perithecia, which are pear-shaped, without apparent orifice, and containing a profusion of minute hyaline elliptic spores, scarce .005 mm. long. These are probably of the nature of spermogonia or pycnidia. It is very probable that similar bodies may be found, if sought after, in other species.

There is, however, one point which is alluded to by Mr. Berkeley in his paper deserving of confirmation. He says, "The *Cladosporium* is commonly developed on a dusty coat of honey-dew, and affords a convenient matrix for the growth of other mucedinous fungi." The Lime is peculiar in its profuse honey-dew, and this is one of the commonest *habitats* for the *Cladosporium fumago*. Some Willows are similarly affected, and these again furnish a home for the *Cladosporium*. Dr. W. G. Farlow, in one of his recent papers on parasitic fungi, alludes to this association of *Fumago*, or rather of *Capnodium*, with insects, and his remarks may well be embodied here. Dr. Farlow contends that the various species of *Capnodium* are developed upon the remains and exudations of insects, and not directly on the bark and leaves of trees. He says that "during the month of October, 1876, he had a good opportunity to observe how closely *Capnodium elongatum* followed the presence of certain insects. He observed a bluish-grey mass which, in the distance, seemed like the plasmodium of some species of *Myxomycetes*, judging from the colour and the manner in which it spread over everything with which it came in contact, entirely regardless of its nature, whether vegetable or mineral. A closer examination showed that the Alder bushes on or near which the fungus was growing were covered with insects of a white colour, covered with a woolly substance and producing a copious oily exudation. These insects were determined as a species of *Eriosoma*. Wherever the exudation fell, whether on other insects, on the ground, on dead sticks, ferns, or any other substance the fungus at once made its appearance. In some cases where the exudation dropped upon other insects they were covered by the bluish-black fungus while still alive. All this, he says, serves to strengthen the view previously maintained that the fungi of this group grow upon the exudation of insects rather than directly upon the bark and leaves of plants."

Here again we may revert to the observations by the Rev M. J. Berkeley, in the fourth volume of the Journal, where he says that these and similar growths "are often, if not always, preceded by honey-dew, whether arising from Aphides or from a sugary secretion from the leaves themselves; frequently, too, they are accompanied by some species of *Coccus*, especially in the genus *Citrus*." And when describing the parasite further on he remarks that "there is generally a cellular pellicle spreading over the surface of the leaf, from which the mycelium springs immediately, but which sometimes arises from the rooting base of its threads." This would favour the view that the early stages of the fungus at least are confined to a parasitism upon the honey-dew. It is peculiarly the case with *Capnodium* that the black mass separates easily and flakes off from the leaf, exhibiting no trace of penetrating or attaching itself to the stomata. In some allied genera a similar circumstance has been observed. Whether the *Capnodium* is a true parasite of the leaf or is only an inhabitant of some excretion, its action in choking up the stomata, and checking the healthy action of the plant, will be the same. A year or two since some Oranges and Lemons in a conservatory in the south of England were infested with *Capnodium citri* in a perfect condition, but as yet we have heard of no instance in which *Capnodium elongatum* has made its appearance on Vines or Figs in this country, although a small species is not uncommon on Cherry-Laurel.

Part V.

[Read at Meeting of the Scientific Committee, 2nd July, 1878.]

It will be remembered in this Committee that some six months ago I directed its attention to the occurrence of a supposed new form of Vine Disease which had appeared in France, particulars of which I then promised to present as soon as these were communicated to me by Mons. Maxime Cornu, the learned French Mycologist, who had investigated the subject. I am now enabled to state his views as published in the "Bulletin de la Société Botanique de France." Two different parasites are alluded to in this paper, the first "Anthracnose," or "canker" (*chancre*), the other *Cladosporium*. The first of these he describes as follows:—

"The vineyards of the Narbonne district have been attacked

this year by a new disease caused by a special fungus, which I believe, with Monsieur Planchon, to be identical with the *Phoma uvicola*. This disease, which has received the name of Anthracnose, is characterised by its peculiar effects on the boughs and leaves, and on the grapes. This parasite produces on the grapes a circular spot, black as if burnt, in the middle of which a smaller white circle is seen formed by the development of the conidiferous form of the fungus.

“On the stem these black spots become depressed circles; the stem appears corroded, and burnt through to the woody tissue, sometimes to the pith. It is this peculiar effect which has caused the disease to be sometimes designated by the characteristic name of canker (*chancre*).

“On the leaves spots of different sizes are seen, more or less confluent, formed by the dried up tissue which has been affected by the influence of the parasite.”

This is all the information which the said communication contains with regard to this new disease. It was stated at one of the meetings of the Mycological session last autumn, that the disease was a threatening one and likely to assume considerable importance. Specimens were at the time exhibited, and a portion of these was placed in my hands showing the scorched spots of the branches, and also some shrivelled grapes. I have examined both in vain to find spores of the *Phoma*. There are distinct appearances on the stems of the perithecia of a *Phoma*, but without spores. In my mind Dr. Cornu has not established the identity of this disease with *Phoma uvicola*, B. and C., at all satisfactorily. None of the evidence is given in the foregoing extract.

Phoma uvicola, B. and C., is a North American species which occurs on grapes, and I believe upon the fruit only, in North America, where it is not regarded with much dread, or considered any great pest. Specimens from South Carolina have recently been distributed in Ravenel's "Fungi Americani" (No. 17). The perithecia are quite distinct on the dried berries, and the minute spores may be obtained from them in profusion. In the original description there is no mention of burnt spots, and the dried specimens of grapes from the Narbonne district and from South Carolina have not the appearance of identity. Again, the American *Phoma* does not attack the leaves or the stems, and hence is much more superficial, which must be taken into account in such simple forms of fungi. Finally, the scorched spots on the stems and

leaves have not the appearance of being caused by a *Phoma*. There is a *Phoma* on the stems in company with the scorched spots, but it is outside of them, and may only have followed the disease, becoming established on the dying tissue which surrounds the scars. Only the examination of recent specimens can set the question at rest; but my own opinion is that the disease is not identical with the *Phoma uvicola*, B. and C., of the United States, and that insufficient evidence is afforded to enable us to decide whether it is the mycelium of a *Phoma* which causes the scorched spots.

Professor Saccardo has sent me from Italy a disease on grapes which is called *Gleosporium ampelophagum*, Sacc. (*Ramularia ampelophaga*, Pass.), the spores of which are similar to those of the *Phoma*, but there are no perithecia. A very similar appearance is certainly to be observed in the dried specimens and some of the dried grapes from the Narbonne, but I should not assume that they are identical.

The second disease was described by Mons. Cornu in the following terms:—

“I have received from Mons. Blavet, President of the Society of Agriculture of Etampes, leaves and bunches of grapes, showing a disease which had alarmed the vine growers of that district. The grapes, scarcely ripe, showed circular black spots, which appeared to radiate from the point of attachment of the grape; the leaves, partially dried up, were covered in some places rather abundantly with a brown mould.

“The anatomical examination of a single grape showed an abundant mycelium, spreading through the whole of the substance of the tissue, and frequently ramifying. The peripheral portions of the grape contained the earlier stages of the mycelium.

“This mycelium is relatively large and black in colour, the septa are numerous, and the articulations are filled with minute oleaginous globules, it presents in places a felted appearance, the early state of a second form of fructification which has not arrived at maturity. These peculiarities of structure and appearance are those of a *Pleospora* or *Cladosporium*. The leaves showed on their lower surface numerous conidiferous tufts of a fungus belonging to the last genus, the nature of which I was able to ascertain. A transverse section of the leaf shows that the filaments proceed from the stomata and escape in order to form their spores. The filaments are dark brown, septate, ramifying but little, and produce at their extremities small spores either

simple or multilocular. The spores are oval, and variable in form and diameter; they are frequently elongated, and acuminate at their point of insertion.

The form, the dimensions, the nature of the spores and of the mycelium, the diameter of which in all parts is ten times greater than that of the corresponding parts of the parasite which causes the Anthracnose, prevents the supposition that these two diseases of the Vine can have any relation to each other. The grapes are not attacked by the Anthracnose in any definite spot, but it is near the point of attachment this new disease first appears. By this peculiarity alone we are enabled at a first glance to distinguish between the two diseases.

“It is probable that the Vine disease of Etampes ought to be referred to the *Cladosporium*, which develops itself at the expense of the living plant in the same manner as that species which produces the speckled appearance on pears, and which has lately been studied by M. Prillieux. Our species appears to be identical with *Cladosporium viticolum*, Ces. (Rabh. Fung. Ex., No. 1877). This species does not appear to be of rare occurrence in our vineyards. I have met with it several times both in the plain of Montpellier and at Cognac during the numerous excursions I have made through the Vine district when engaged in my researches on the Phylloxera.

“The Vines cultivated in these districts have general cottony leaves, and the parasite, which is found on the lower surface of the leaf, always covered with a thick down, forms greyish spots; these spots are caused by the abundant spores mixed with the hairs twisted together. The presence of these grey spots is perhaps the only character indicating the existence of this fungus, of which the bad effects appear to be easily overlooked. I have never observed any bunch of grapes attacked and blackened like those I received from Mons. Blavet. Perhaps the development of the *Cladosporium*, and of the Anthracnose, may be attributed to the unusual rainfall of this year, and which may make these species formidable in wet seasons.

“I do not hesitate to consider the development of the *Cladosporium* as the cause and not as the effect of the disease. This last hypothesis will not stand examination. The *Cladosporium* is developed on plants in perfect health, and on portions which are not in the least decayed. The same is the case with *Cladosporium dendriticum*, which attacks Pear trees, and which may serve to corroborate what I have just stated.

Dr. Cornu afterwards proceeds to the description of another *Cladosporium* found by him on leaves of *Vincetoxicum*, and concludes thus:—"These species deserve to be studied carefully, as it would be interesting to know the form and nature of their other modes of reproduction. The genus *Cladosporium* includes plants varying much from each other, and which all belong to the Ascomycetes."

Assuming that this second form of disease has been accurately determined as identical with the specimens published by Rabenhorst in his "Exsiccati" (1854, No. 1877), there are some points of interest as to the distribution as well as the synonymy of this mould. It certainly has the merit of bearing many names. Thus it is the *Cladosporium viticolum* of Cesati. It is also the *Cladosporium ampelinum* of Passerini, by which name it is known in Thuemen's "Pilze des Weinstockes." Under the name of *Cercospora vitis*, Saccardo distributed specimens in his "Mycotheca Veneta" (Nos. 284, 363). Pirotta has also published a memoir of the species in Italy under the name of *Helminthosporium vitis*, Pir. Before all, specimens were distributed many years since from the United States by Dr. Curtis, under the manuscript name of *Graphium clavisporem*, Berk. and Curt., and under this name it was described by the Rev. M. J. Berkeley, in "Grevillea," (vol. iii., p. 100). This mould has therefore been referred to four different genera, and has had at least five names. This is not the place or time to discuss which is the genus for which it has the strongest affinity, but it certainly appears to me most closely related to *Helminthosporium*, the bundles of hyphæ being densely crowded, but not united as in *Graphium*, and in fact closely resembling *Helminthosporium Petersii*, Berk. and Curt., on leaves of *Smilax*. It is a rather aberrant form of *Helminthosporium*. (See also "Grevillea," vol. vi., p. 149.)

As to the distribution of this mould, it is curious that *this* also should be known in the United States, as well as in Italy, France, and Austria. It only proves how important it is that we should acquaint ourselves with the parasitic fungi of the United States so many of which appear to be common to the New and Old World. Here are two presumed instances of the occurrence of North American Vine fungi in Europe. Who shall say that we may not even yet have the *Peronospora*?

In conclusion I may be permitted to record a protest against the last words of Mons. Cornu's communication. Because one or two species of *Cladosporium* are believed, on rather strong evidence,

to constitute a condition, or stage of existence, of certain species of *Sphaeria*, it is most unreasonable and most unphilosophical to affirm in such strong and positive language that "the genus *Cladosporium* includes plants which *all* belong to the *Ascomycetes*." This has not been proved; in the majority of cases there is not the slightest evidence of its truth, and it is contrary to the interests of science to make such sweeping and positive assumptions simply and solely on the faith of affinities and analogies.

XIX.—The Native Country of the Potato.

By W. B. HEMSLEY, A.L.S.

[Read at Meeting of the Scientific Committee, 4th June, 1878.]

THIS subject has recently been revived by M. André in the "Illustration Horticole," where he states that during his travels in South America he discovered *Solanum tuberosum* in a wild state, and apparently indigenous, both in Peru and Columbia. M. André seems to be under the impression that he was the first "to prove" that Humboldt was wrong in his assertion that the Potato was not a native of these countries; but in this he is wrong, having overlooked more than one record in English publications. To these records I shall briefly refer, and add some of the more interesting localities of the specimens in Kew Herbarium. Aylmer Bourke Lambert ("Journal of Science and the Arts," x., p. 25) states, on the authority of Ruiz and Pavon, that they had found it near Lima and in the forests near Santa Fé de Bogota. In 1822 Joseph Sabine, at that time secretary to this Society, read a paper before the Society on the native country of the Potato, which was published in the "Transactions," vol. v., p. 249. This paper is illustrated by a plain figure of *Solanum Commersonii* and a coloured figure of a presumed variety of *S. tuberosum*, raised in the Society's garden from tubers received from Chili, and the author's object is to show that *S. tuberosum* is wild in Chili, and that the wild Potato of the eastern side of the continent is a different species—namely, *S. Commersonii*. In 1847 our President, Sir Joseph Hooker ("Flora Antarctica," vol. ii., p. 329), classified the wild specimens of Potato plants then existing in the Hookerian Herbarium under *Solanum tuberosum* and *S. Commersonii*, with remarks on their distribution and the difficulty of determining whether they should be referred to one or more species. He also hints at the possibility

of *S. Commersonii* being the original wild type from which the cultivated varieties of Potato have sprung. Dr. Lindley read a paper on the same subject before this Society in 1848; this was published in the "Journal," vol. iii., p. 65. The author treats more particularly of several varieties of Potato raised in the Society's garden from wild Mexican tubers, communicated by Uhde, and expresses the opinion that *S. tuberosum* grows wild in Mexico. He regards *S. verrucosum* of Schlechtendahl, collected by Galeotti on the Peak of Orizaba; at an elevation of 10-12,000 feet, as a variety of *S. tuberosum*, as also *S. stoloniferum*. Amongst the very numerous species of *Solanum* inhabiting America, from Mexico southwards on the western side of the country to South Chili and across the continent to Uruguay, etc., there are several which produce tubers, and some of them are very distinct from any variety of Potato, whilst other forms which have been described as species so closely resemble some of the varieties of Potato that experienced botanists and gardeners have regarded them as such. It has been objected that the plant found by Ruiz and Pavon in Peru and New Granada was *S. immite*, but Duval, the author of it, says, "An *S. tuberosi* mera varietas?" What I have seen under this name was collected in Peru by Matthews, who called it *S. tuberosum*, and it is Hooker's variety, *multijugum* of *tuberosum*. It is a distinct looking form, though not more so than many cultivated varieties of the true Potato. A form common about Valparaiso, said to have bitter tubers, invariably white flowers, and a long, exserted style has been described as a distinct species under the name of *S. Maglia*. The plant figured by Sabine in the "Transactions," vol. v., p. 11, agrees exactly with *S. Maglia*. After examining the numerous specimens at Kew of *S. tuberosum* and its allies and a large number of cultivated varieties of the true Potato, I think it possible that more than one wild form or species has been concerned in the production of the latter. The cultivated varieties exhibit quite as wide a range of variation in the lobing and degree of hairiness of the leaves, in the shape and size of the calyx-lobes, in the colour and size of the flowers, in the relative length of style, and in the size, shape, and colour of the berries as the difference between *S. tuberosum* (whatever this may be), *S. Maglia*, and some of the others, and these extreme varieties would be dubbed species if they existed in a wild state. It may be that both the cultivated varieties and several of the wild forms described as species have descended from one common type,

or the former may be the progeny of more than one of the latter. In determining the native country of the Potato it seems to me we must adopt the same standard for our species, whether wild or cultivated, and admit the same extent of variation, otherwise we cannot speak of the Potato, which comprises all these varieties, as being wild in any particular locality or district. Admitting a certain amount of variation in the wild plant, there is no doubt that the Potato is now wild from Mexico to Chili, and across the continent to Uruguay and Buenos Ayres, but scarcely any two specimens are alike. Sir Joseph Hooker, in the place referred to, enumerates six varieties of *S. tuberosum* and five of *Commersonii*, independently of some other forms which he mentions but does not include under either of these. At the present time there are upwards of a dozen additional equally distinct wild forms in the collection at Kew. Jameson collected one at Lloa, at an elevation of 8000 feet, in places where the forest had been cleared with the object of cultivating the soil; Hartweg a totally different one in Mount Picacho, Agnas Calientes, Central Mexico; McLean another in Huamantango, Peru, at 10,000 feet; and Mandon one near Lorata, in Bolivia, at 11,656 feet; Spruce collected a *Sacha papa*, or wild potato, in the Andes of Quito, at an elevation of 12,000 feet. This is of dwarf, dense habit, and the tubers and berries are said to be edible, the former reaching the size of a pigeon's egg. There is also a specimen at Kew from Venezuela, collected by Fendler, without any precise locality, and Bourgeau sent a *Solanum* from Mexico, "with tubers like the Potato." I have already given the habitats of some of the wild forms which have been described as species, and shown generally the distribution of the tuberous *Solani* of close affinity with *S. verrucosum*, *S. Maglia*, etc. Seeing that the Potato was first imported into this country from Virginia, it is impossible, in my opinion, to fix upon any particular wild form to the exclusion of others as its progenitor, thereby limiting or defining its native country. With regard to the bitterness, acidity, or even poisonous properties attributed to the tubers of some of the wild forms, we know that tubers of cultivated varieties become unwholesome from exposure to full light. Gibert, who collected typical *S. Commersonii* at Monte Video, says the tuber "a absolument le goût de la pomme de terre ordinaire," whilst Tweedie says it is poisonous.

XX.—On the Nomenclature of Garden Plants.

By DR. M. T. MASTERS, F.R.S.

[Read at the Scientific Committee, 19th November, 1878.]

THE nomenclature of garden plants—that is, of plants cultivated in gardens—is admitted on all hands to be in a very unsatisfactory condition. A glance into the first nursery catalogue that comes to hand will suffice to prove the truth of this assertion. It is proposed in the following remarks to consider some of the reasons for this confusion, and to bring forward certain points for discussion and consideration, in the hope that eventually some steps may be taken to remedy the inconvenience, or at least to check its further increase.

The confusion alluded to arises from various causes, some attributable to the botanist, others to the gardener. Among these causes may be mentioned the misapplication of names. A name, correct enough it may be in point of form, is given to a plant by mistake or carelessness, or the name originally correct may become perverted and distorted by misspelling, as when the pear *Joséphine de Malines* becomes in the vernacular “Joseph on the palings.” The misuse of synonyms is another fertile source of confusion. Misstatements, accidental or wilful, add to the disorder, while the application of names, often absurd or cumbrous, by incompetent or unqualified persons, botanical or horticultural, is the most prolific cause of perplexity.

In proceeding to discuss these various sources of mischief, we may arrange them into two heads, Botanical and Horticultural. We shall touch but lightly on the botanical aspect of the question, because botanists have a code of their own, which they obey more or less loyally, and whose regulations can at least be appealed to in cases of dispute or difficulty. The horticulturists have no such code, and the important point for us to consider is whether it would be desirable they should have such a code, whether the botanical code could or could not be adapted to their requirements, and whether, suppose such a one framed, they would obey its provisions. We know unfortunately that the uniformity of practice among botanists is not so complete as might be desirable, and we think we may add of horticulturists that “where they *do* agree their unanimity is wonderful.”

Adverting now to the share of the botanist in the disarrangement and misarrangement of names, it may be said that the evil

arises for the most part from the imperfection of the materials at his disposal. On the principle of recognising Hercules from his foot, or a lion by his claw, a botanist is too often expected to recognise some miserable scrap of a specimen, smashed it may be beyond hope of certain recognition in its transit through the post, and rendered unrecognisable by the stupid practice of enveloping the "specimen" in cotton wool.

Should the temper of the botanist under these circumstances be sufficiently unruffled to enable him to give a coherent answer at all, it is, to say the least, not at all unlikely that the name he assigns to the bruised and maimed fragment is wrong—that the foot is not that of Hercules, the claw not that of a lion. Imperfect specimens then, often unavoidably imperfect, engender faulty nomenclature.

But the specimen may be a good one, while the means of comparison and identification may be defective. Even the rich herbarium at Kew, admirably arranged as it is for purposes of research, is not, cannot be complete. The means and facilities at that establishment transcend those offered by any like institution at home or abroad, and the willing help and hearty co-operation there afforded to anyone engaged in serious research demand the most cordial and grateful acknowledgment. Still it is possible to take a good specimen to the Kew herbarium, to avail oneself of all the resources of that unrivalled establishment, to profit by the kindly aid of the staff, and yet to make mistakes—mistakes of identification sometimes arising from the fault or defect of the inquirer himself, or mistakes arising from the fact that a particular species, known to science, is not represented in the herbarium, or that a particular book in which that species is described or figured is wanting from the shelves of the library. Of mistaken identifications we say but little; how they may arise is but too obvious. The only consolation is, that those wiser and more experienced than ourselves occasionally lapse into similar errors.

Turning now to the horticulturist proper as a creator of confusion in nomenclature, it must be admitted that he is too often guilty, as Mrs. Malaprop would say, of a "great derangement of epitaphs." With little botanical knowledge he is necessarily unfamiliar with botanical usage, and so, if he ventures to act as sponsor, as he sometimes does, the result is not satisfactory.

In the case of newly-imported plants the general practice—and it is one which cannot be too much commended—is to seek the assist-

ance of the authorities at Kew, or of those botanists who have made a special study of the order to which the new plant belongs, or is supposed to belong. In this manner not only is horticulture benefited, but botany also, as by this means a knowledge of many new forms and a better acquaintance with old ones is obtained. Moreover it is impossible to over-estimate the value of the knowledge which many of our nurserymen and their assistants have acquired from long experience, and from having constantly under their eyes particular sets of plants. What professed botanist would not envy the knowledge of plants possessed by a Veitch, a Dominy, a Bull, a Williams, to name only a few among many?

On the other hand, when care like that above alluded to is not practised, or where a knowledge of plants is defective, all sorts of errors in nomenclature creep in; tallies, once rightly affixed, get shifted and cannot be properly replaced; other tallies suffer from faulty copying. Errors of spelling creep in, and having crept in, spread with a vigour more surprising than satisfactory. In this manner perversions of Latin, or it may be of French or German, names become only too common, to the bewilderment of the amateur, the distress of the botanist, and the utter mystification of the poor gardener.

In what has just been said we have had in view nomenclature and perversions of nomenclature applied in all good faith. There may be instances where changes of nomenclature or an improper application of names are made wilfully for the sake of some supposed advantage. If such exist it is needless to advert to them here, as everyone would reprobate them, and in the end the sin would surely bring its own punishment.

Another of the many difficulties which beset the question of the Nomenclature of Garden Plants is that arising from the changes which botanists, with good or bad reason, make. Ought these changes to be followed by gardeners or nurserymen or should they ignore them? When followed partially endless confusion arises, as it is not practicable, so far as we can see, to enforce universal compliance, and so the same plant in one nursery bears one name while in another it is called something else. To take an instance: few, if any, botanists now accept *Weigela* as a genus. By Bentham and Hooker, Karl Koch and most later authorities, *Weigela*, or *Weigelia* (for it is spelt in both ways), is merged in *Diervilla*. This being so, are we in gardens to say *Diervilla japonica* and *Diervilla rosea*, or *Weigela japonica*

and *Weigela rosea*? Are we to call our Gloxinias by the name of *Ligeria*, with Decaisne, or by that of *Sinningia*, with Bentham? What ought to be done in such cases for strictly botanical purposes is not doubtful. There is the canon law obeyed, as we have said, more or less loyally by all botanists. The question is, whether the usage most common (we wish we could say universal) among botanists should be also adopted in gardens? The answer to that question, we think, depends upon the use to which the name is to be put. If the name is to be used as a sign or indication of a scientific fact, or as a distinctive label for scientific purposes, then botanical usage should of course be followed. But in the vast majority of gardens no such scientific aim exists. The nurseryman labels and catalogues his plants for commercial purposes only. The ordinary gardener only wants a name, as it were as a label, and it does not much signify to him what the form of the label may be, provided it be distinct from others. Should gardeners or nurserymen attempt to follow the changes in botanical science or the fluctuations of individual opinion they might be altering their names every month in the year, and would thus give rise not only to inevitable confusion, but possibly also to imputations of a very unpleasant character.

For purely commercial purposes, then, we think that as a general rule, subject to exception, garden names once established should not suddenly be altered. To fall back on our illustration *Weigela rosea* should be *Weigela rosea* still for garden purposes. For botanical purposes it should at once be called *Diervilla rosea*. Gloxinias in gardens should remain Gloxinias still, while in botanical establishments they should be ranged as *Sinningias*. The phrases "subject to exception" and "once established" leave a loophole and may be criticised accordingly. Be it so. The naturalist, who knows the impossibility of framing a definition that shall be universally applicable, will not quarrel with these loopholes. Names and definitions, so called, in natural history must of necessity be more or less arbitrary, and their usage must be more or less elastic. And so the rule must have many exceptions, and the expression "once established" may serve as one. *Weigela rosea* is no longer botanically correct, or at any rate it is not so correct as *Diervilla rosea*, but the former appellation is now established in gardens and for garden purposes. The advantages to be derived from changing it would be outweighed by the inevitable confusion that would be begot. The very moderate success that has attended the

attempt to substitute the more correct word *Pelargonium* for *Geranium* among the general run of gardeners is not an encouragement to proceed far in this direction. But suppose *Weigela* were a name of only quite recent application, and one not generally known in gardens, or applied to a plant not yet in trade lists, then most decidedly the more correct botanical name should be employed.

In a public botanical garden the botanical name should be the one preferred, but the garden name should be given also, as a synonym, on the tally. The gardener or the amateur would then see at a glance both the correct and the provisional name, and gradually the more correct appellation would be adopted and the less correct one would fade out of usage. But that this would be a very slow process is proved, as has just been said, by the still frequent employment of "*Geranium*" where *Pelargonium* is meant.

In the herbarium, as a matter of course, the botanical usage would be strictly followed. In the proposed "*Hortus Europæus*" both names correct and conventional should be used, precedence being given to the former. The case of the gardening journals presents a difficulty as considerations of time and space would often prevent both names from being used. To employ the scientific nomenclature alone would be to use names not known to the majority of their readers. On the other hand, if the journalists confined themselves simply to garden nomenclature, they would be open to the reproach of failing in one of their most important duties—the dissemination of correct information. It would seem clear, then, that the proper course to follow, wherever space or other circumstances permit, would be to cite both names thus: *Diervilla* (*Weigela*) *rosea*.

Where, as often happens, a provisional or a garden name has but a short existence, or does not become established, then, of course, the sooner it is buried the better. The correct name should be adopted as soon as possible, and the temporary appellation be no more heard of in any shape or form. Unfortunately this consummation devoutly to be wished is only likely to be realised in a very small proportion of cases. For the other much more numerous instances we see no better general rule to be adopted than the one we have laid down, but we shall be glad to receive the opinions of the Committee on the subject.

It may be well to add that these remarks apply exclusively to species or reputed species. Natural varieties, seedlings, and

sports or bud-variations, open up other points which we cannot consider now. But in passing we must earnestly protest against the practice of stringing a long array, jumble rather, of Latin or Greek adjectives, often irrespective of grammatical propriety, cumbersome to speak, laborious and troublesome to write. Such names should find no place in the garden, scientific or otherwise; they should not encumber the pages of any catalogue nor any journal. Unfortunately once launched, the journals are obliged to use them, but we owe for our own part to a feeling of repugnance when we are obliged to write such terms as *Osmanthus Aquifolium variegatus nanus*, *Ilex Aquifolium myrtifolia aureo-marginata*, or *Ilex Aquifolium parvifolia conspicua argenteo-marginata*, and such like. Scientific nomenclature had become an intolerable burden when Linnæus swept it all away and substituted the simple binomial nomenclature, the surname and baptismal name, as it were, for the descriptions which, prior to his time, served the purpose of names. Would that some Linnæus would arise and make a clean sweep of the incongruous jumble of names given to varieties of Ivies, Hollies, Ferns, and many other plants. Far be it from us to deny the right of these varieties to distinctive appellation. For garden purposes the varieties in question are quite as important, often more so, than the species itself, or what botanists agree to consider the species. For scientific purposes these variations are also all important. If there was a time when they were held in relatively light esteem by some botanists, that period vanished when Darwin published his "Origin of Species." Darwin taught the botanists the true value and significance of these heretofore little regarded forms, and taught the naturalists (as Peter was taught not to call any man common or unclean) that the most apparently insignificant of these varieties may perchance furnish a clue to some of the deeper mysteries of Creation.

Lastly, there remains the question of the proper nomenclature for hybrid or crossed seedlings artificially raised by the gardener himself, having, so far as we know, no counterpart in Nature—unless perchance moth or bee may unwittingly have done what the hybridiser with set purpose has effected. Here again, for strictly botanical purposes, the botanist has rules to follow, and which he obeys rather less well than other parts of the canon, but it will hardly be thought desirable to introduce into mere garden catalogues the phraseology which botanists have invented, not merely to denote the nature of these productions, but at the same time to in-

dicate their parentage. We may think this attempt to kill two birds with one stone as injudicious as the combination of nomenclature and description in the case of the Ives and Hollies we have just now alluded to, but that is a matter for the botanists. We prefer here to treat the question chiefly from the gardeners' point of view, and from that standpoint we think it will be admitted that the adoption of strict scientific rule would in this case be objectionable.

For botanical or physiological purposes a scientific nomenclature is essential, and every botanist knows where to seek or how to frame it. For garden purposes, where no such lofty purpose is aimed at, a vernacular nomenclature for the infinite number of garden varieties seems to us to be preferable. Waterer's Holly, Williams' Croton, Veitch's *Dracaena*, Paul's *Crataegus* seem to us preferable to *Ilex Aquifolium*, var. *Watereri*, and so forth. And so, for the ever-increasing hosts of new varieties of Camellias, of Roses, of Pelargoniums, of Carnations, of florists' flowers generally, English or vernacular appellatives should be used, and such as should not be likely to cause confusion. To call a Pelargonium which is perhaps the offspring or representative of fifty or a hundred artificial crosses, by such names as *carneum*, *roseum*, *longifolium* is to run the risk of creating confusion between the very mongrel product of the gardener's art and the relatively purely bred species.

There is one objection to the use of vernacular names that must not be passed over—the difficulty which foreigners have in spelling and pronouncing them. In this country the greatest difficulty is experienced in spelling and pronouncing Russian, Polish, Hungarian, or even names so little separate from us geographically and linguistically as the Flemish. In how many cases nowadays, when Russian enterprise is adding so many gems to our store, are we not perplexed by

“A name which you all know by sight very well,
But which no one can speak and no one can spell.”

How seldom can the possessor of such a name rank himself, out of his native country, among those of one of whom it has been said—

“Thrice happy he whose name has been well spelt.”

But so long as nationalities and languages exist, so long will this difficulty remain. It has been proposed in this case also to us the Latin language exclusively, but while this would be most desirable

for scientific purposes; in gardens the difficulties of pronunciation and spelling would not be overcome by the conversion of a Russian into a bastard Latin name.

It must not be thought that the adoption of a vernacular name need indicate any lower commercial value or any lower social position, if we may so say, for these products of art, or these illustrations of the infinite diversity of natural forms. Far from it. If the variations, the seedlings, the sports which Nature herself produces, be worthy of our admiration and study, so undoubtedly are also those which owe their origin to the intelligent purpose and skill of the hybridiser.

Which is the man who benefits his race the most—he who finds and describes a new form of Rose in a hedge-bank, or he who “raised” *Gloire de Dijon* Rose? We need not enter too closely into the motives of the two men. We know, or we will assume, that the motives were excellent in both cases, but still the fact remains that for present practical purposes the “raiser” has the pre-eminence. How proper then that in such cases the raiser’s name should be attached to his production, or that the labours of such men as Anderson Henry, of Knight, of Rivers, of Standish, of Marshall Wilder, of Dominy, of Seden should be attached to such productions. How improper, on the other hand, or at least how distasteful and inappropriate, such appellations as Dusty Bob, Stump the World, Try me oh! and a variety of similar names, better suited for the music hall than for the garden.

In order that these somewhat discursive remarks may tend to some practical end, we would now venture to offer a few suggestions as to the best means of remedying the inconveniences we all of us more or less experience, and of hinting at what might be done by our Committee and by the Society. It must be remembered that these suggestions are offered with becoming diffidence, and with the view of eliciting the opinions of others, so that the matter may be fairly discussed upon its merits.

In the first place, an authoritative garden catalogue is a crying want of our times. Were a new edition of the “*Hortus Kewensis*” prepared, or a “*Hortus Europæus*,” such as has been talked about at various congresses, we should at once have as complete a list of authentically named plants as would be possible. It is foreign to our present purpose to discuss this matter now. Suffice it to say that much progress has already been made in the accumulation of material for this purpose; that the last

Annual Report of the Royal Gardens, Kew, contained a catalogue of one important Natural Order; and we trust that others may in due time be forthcoming. Indeed, so much has been done in the case of several of the Orders that but little more is required beyond condensation and revision so as to secure uniformity of treatment.

In the next place, our Society might do more than it does to discourage haphazard nomenclature, and to promote a more accurate system. In the case of a newly-introduced plant no name should be officially recognised till evidence is afforded that proper care has been taken to secure correct nomenclature. In those cases where, owing to the plant not being in flower, or where from any other cause the correct name cannot be given, a provisional name must be employed, but the certificate—if the plant should be awarded one—should be provisional also, and should be replaced by a permanent award when the name of the plant is correctly ascertained. This would involve a periodical investigation of the provisional certificates, a matter which would not entail any very great labour, but of which the results, if properly carried out, would be most advantageous alike to horticulture and to botanical science.

But if, as we fear would be the case, this scheme be not practicable, the Scientific Committee, or a sub-committee of that body, might appropriately be told off to supervise the names of plants exhibited as new, or of those whose identification seemed doubtful—a duty which, with the assistance to be had at Kew would not be a very irksome one.

With reference to the nomenclature of florists' flowers, garden hybrids, the endless varieties of Crotons and Dracaenas, the interminable series of new or so-called new Peas, and other fruits and vegetables—the Floral and Fruit Committees might very appropriately exercise some control. They might do much towards insuring accuracy, regulating uncouth or absurd appellations, deleting useless synonyms, and the like—tasks all the more easily carried out with the assistance of the experimental ground at Chiswick.

We do not of course suppose that the Society could enforce any code, but its example would be very powerful, and the refusal to give permanent certificates till the nomenclature of the object exhibited had been properly settled would greatly tend to the reform of garden nomenclature.

As Botany, together with Zoology—the science of living beings

must rank of right amongst the highest of human studies, so should its nomenclature be correspondingly distinctive and accurate—fit instrument for a lofty purpose. And as gardening is one of the purest and most beneficial of human pursuits, ministering to our needs, enhancing our pleasures, and revealing to those who have eyes to see no small number of the marvels of created Nature—no mere passing glance into the working of her machinery—so should its nomenclature be not only adapted to its utilitarian purposes, but also be made consistent with good taste, refinement and elevation of spirit.

XXI.—Note on a Disease in the Ash. By W. WILSON-
SAUNDERS, Esq., F.R.S.

[Read at Meeting of Scientific Committee, 16th April, 1878.]

SOME little time since I brought to the notice of the Royal Horticultural Society a peculiar disease affecting a species of Poplar in the neighbourhood of Worthing, and which sooner or later was fatal to the life of the tree.

I beg now to offer some remarks on another disease in which I found two Ash trees suffering from near Torquay—a disease which, although it does not appear to cause the death of the tree, is one of a very serious character, eating its way to the very centre of the wood, and swelling and breaking up the bark in a very remarkable manner.

One of the diseased trees grows near the roadside at Watcombe, and the other in a garden at Warberry Hill, [removed some three miles or so from each other. I examined many other Ash trees in the vicinity of Torquay, but found the disease only on the two trees I have mentioned. Several other Ash trees showed signs of stunted growth, either from being subject to the winds off the sea, or being in situations as regards soil where a healthy growth could not be expected. The disease which I am about to describe and illustrate by drawings seemed to prevail more or less all over the trees, from the youngest branches to the main stems. It first appears as an irregular crack in the bark, with a raised rufescent margin. This crack soon assumes an open gaping aspect, widening and enlarging until it often surrounds the branch, although the branch be several inches in diameter. Within the gaping margin the bark is seen of a dark brown colour,

and is very rugged and irregular, rising into all manners of shapes, and where solid of a greatly increased thickness. The wood under the diseased bark is eaten away as it were, and cavities are formed leading to the very centre of the stem in advanced stages of the disorder. These cavities are generally lined with the discoloured diseased bark, and are well defined, and have the adjoining wood of a healthy character to all appearance. The drawings, which I have made with much care, will better illustrate the character of the disease than any description I can give; but it will be well to refer to them more particularly, and make some further observations on the facts they show.

Fig. 1 is a young branch from the Watcombe tree of about

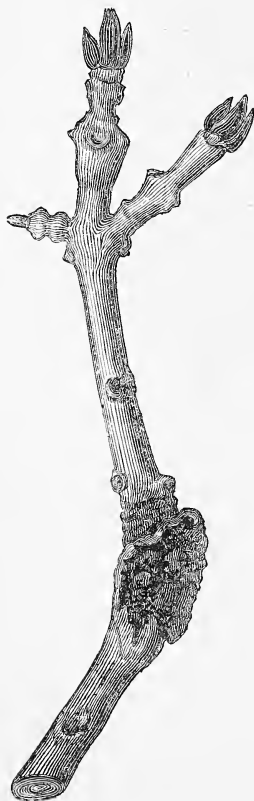


FIG. 1.—Natural size.

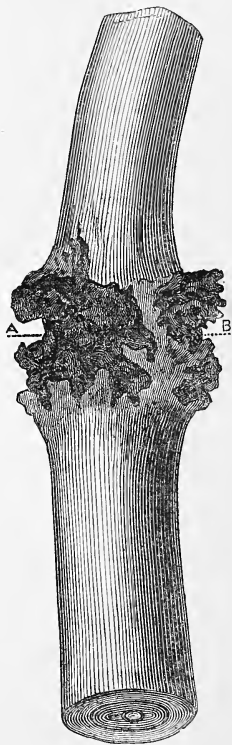


FIG. 2.—Natural size.

three years' growth, on which a wide open expanded wound appears, encircling about one half of the circumference and situated on the apex of the three-years-old portion of the branch. This severe wound, it will be observed, has not hindered apparently healthy although stunted growth on the two-years-old portion of the branch beyond it.

Fig. 2 and section, fig. 3, show a wound surrounding a young branch from the Warberry Hill tree. Although the branch, which had about four years' growth, was entirely encircled with

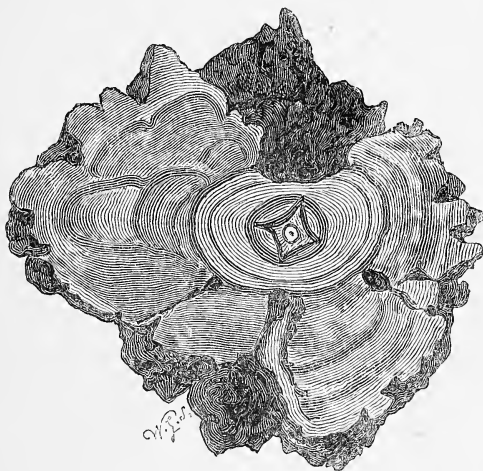


FIG. 3.—Twice natural size.

the wound, and the bark remarkably swollen and distorted, yet the prolongation of the branch was showing strong signs of vitality, and was apparently in a healthy condition both as regards the wood and the bark. The diseased bark, which as I have observed is much swollen, has assumed a corky nature where solid, and has expanded very irregularly. Here, it will be observed, the disease is gradually entering the wood (fig. 3), and has gone through the wood of the last year's growth.

Fig. 4 and the section, fig. 5, show states of the disease occurring on branches of sixteen to eighteen years' growth.

Fig. 4 is a patch of the disease of rather long standing, widely gaping, and exhibiting the rugose bark well filling up

the wound, which penetrates the wood in two places, each of a triangular form, the apex pointing directly to the centre of the

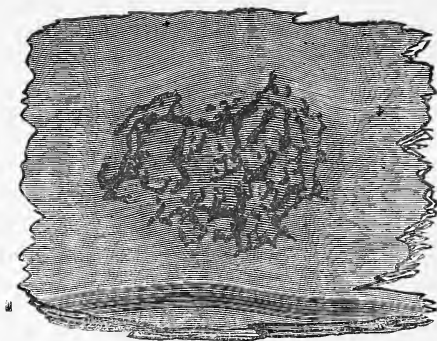


FIG. 4.—Natural size.

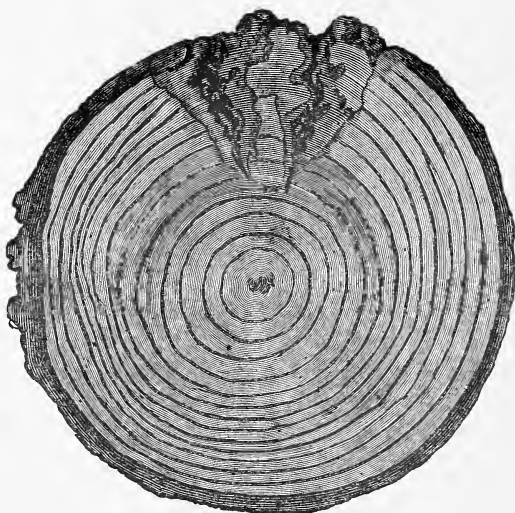


FIG. 5.—Horizontal section of Fig. 4.

branch, towards which point they have penetrated at least half-way.

Fig. 7 portrays a portion of a branch of fourteen or fifteen years' growth, on which the disease is of an extensive and advanced character, covering many superficial inches of the sur-

face, and very deeply seated in the wood, as shown in the section, fig. 6.

This branch was bearing many branchlets, all showing more



FIG. 6.

or less the disease, but still having much life in them, as they were forming healthy-looking young shoots and leaves well developed. It is difficult to describe the character of the disease in this advanced state, but the drawing will show that one long, irregular, gaping opening runs through the whole length of the wound, and near the upper and lower ends there are transverse openings of the same nature encircling more than one half of the circumference. These gaping openings into the wound are margined by the much diseased bark rising into various nodulous shapes and spreading some distance on either side. On the left side of the longitudinal wound the bark of the branch for some five inches in length, and two to three in width, has lost its vitality, and assumed a rufescent tint, and has a considerably-sized open wound on the centre of the rufescent space.

Fig. 6, which is a horizontal section of the branch a little

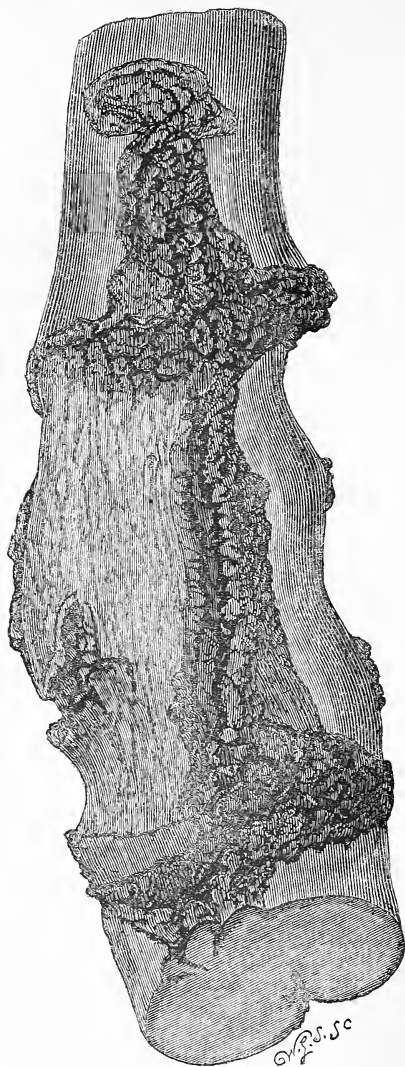


FIG. 7.—Half natural size.

below the lower transverse wound, shows that the disease has penetrated to the very heart of the wood and is there spreading itself. It will be well to observe that the yearly growth of the wood between the centre and that portion of the circumference where the bark is swollen and diseased is very different from that on the other side of the stem. In the former the zones are much diminished in width and irregular, while in the latter the zones appear regular and of an usual character.

I may mention that I have carefully looked for any insect action while examining the specimens from which the drawings were made, and I do not perceive that there is any trace of insects having had anything to do in causing the disease which I have attempted to describe.

[*Note.*—All the drawings are from the tree on Warberry Hill, except Fig. 1, from the Watcombe tree.]

XXII.—REPORT on Endives Grown for Trial by the Fruit and Vegetable Committee, at the Society's Gardens, Chiswick, 1878. By A. F. BARRON.

ENDIVES are divided into two great classes.

1. *Curled Endive*. The *Chicorée frisée* of the French. Leaves deeply cut or lacinated and curled.
2. *Batavian*, or Broad-leaved. *La Scarole* of the French. Leaves broad, resembling lettuce.

The collection was sown on July 1st, and treated in the usual manner for an early autumn supply. The season being favorable, the autumn fine and open, they succeeded well, so that the trial was in every respect satisfactory.

1. CURLED ENDIVES.

1. *Ever White Curled* (Vilmorin). See White Curled.
2. *Fine Curled Moss* (Vilmorin). See Moss Curled. A fine selection.
3. *Fine Curled Picpus*. See Picpus.
4. *Fine de Rouen*. See Stagshorn.
5. *Gloria Mundi* (Minier & Co.). See Green Curled.
6. *Green very fine Curled Summer* (Vilmorin). Leaves about 6 inches long, resting close on the ground, with a broad fleshy midrib, the edges toothed and much curled; of a deep green colour. Forms very large, full hearts, which blanch readily and early without much tying. Crisp, fleshy and excellent.
7. *Green Curled* (Minier & Co.). Leaves from 7 to 8 inches long, lying flat on the ground; very deeply cut and toothed; of a bright green colour. Forms large, full hearts, which blanch readily on being tied; somewhat liable to rot in wet weather.
8. *Green fine Curled Winter* (Vilmorin). A good selection of Green Curled.
9. *Green Curled Ruffec* (Vilmorin). A very good selection of Green Curled.
10. *Imperial Curled* (Vilmorin). A variety of the White Curled, with broader leaves and not quite so much cut. Good.
11. *Lacinated Louviers* (Carter) (Vilmorin). Leaves short, very

deeply cut and lacinated in a singular manner; of a dull glaucous green colour. Forms close, full hearts of excellent quality, which blanch naturally to a good extent. This variety will not tie up; requires covering up to blanch thoroughly; very hardy.

12. *Large Ruffec* (Watkins & Simpson). See Green Curled.
13. *Louviers*. See Lacinated Louviers.
14. *Moss Curled* (Carter) (Minier). Leaves very short, very finely cut and curled like moss; of a bright green colour. Forms small, compact, full hearts of very fine quality. This variety is too small to tie up; requires to be covered up to blanch thoroughly. Fine for garnishing and for early use, but very liable to rot in moist weather, and is rather tender.
15. *Picpus* (Vilmorin). Leaves long, lying flat on the ground like the Green Curled. Of a very deep green colour; deeply cut and finely curled, thick and fleshy. Forms very large, full hearts of fine quality. A very fine vigorous growing variety; one of the best types of Curled Endive. First-class Certificate.
16. *Rouen*. See Stagshorn.
17. *Ruffec*. See Green Curled.
18. *Stagshorn* (Vilmorin). Leaves very short, very deeply cut; like the Louviers but somewhat smaller than that variety; very hardy.
19. *Selected Green Curled* (Veitch). A good selection of Green Curled.
20. *Wrench's Moss Curled* (Wrench). See Moss Curled.
21. *White Curled* (Carter) (Minier) (Veitch). Leaves from 7 to 8 inches long, lying flat on the ground, deeply cut and finely curled; of a very pale green colour, hence called white. Forms fair-sized hearts, but requires tying up to blanch thoroughly; a very distinct variety in appearance, and hardy. First-class Certificate.

2. BATAVIAN OR BROAD-LEAVED.

22. *Broad-leaved* (Vilmorin). See Round-leaved.
23. *Broad-leaved Winter* (Vilmorin). Leaves long, broad; deep green, slightly toothed and wavy in outline; requires tying up to form hearts. A good, hardy, late variety.

24. *Fraser's Broad-leaved* (Minier) (Veitch). See Broad-leaved Winter, No. 23.
 25. *Green Batavian* (Carter). Leaves very long, narrow; forming small hearts. Worthless.
 26. *Round-leaved* (Carter) (Minier) (Veitch). Leaves from 10 to 12 inches long, broad, light green, toothed and wavy in outline, the outer lying flat on the soil, the inner incurving from the points and thus forming a close heart, which blanches naturally to some extent. When tied up, a close, firm heart is formed, as white as ivory and of excellent quality. This is by far the best Batavian Endive.
 27. *White Batavian* (Carter) (Minier) (Veitch). Leaves long, resting flat on the ground; of a pale green colour. Forms small hearts, which require tying up. Very apt to decay in moist weather. Worthless.
-

XXIII.—REPORT on Double Flowered Ivy-leaved Pelargoniums
Grown for Trial at the Society's Gardens, Chiswick, 1878.
By A. F. BARRON.

THE introduction of M. Liebmann's double-flowered form of the Ivy-leaved Pelargonium, "*König Albert*," some few years ago, was a pleasant surprise, being the commencement of a new class of highly ornamental plants which are exceedingly suitable for the decoration of the Conservatory and also for cut flowers. The elegant and chaste forms of the single-flowered varieties of the Ivy-leaved Pelargoniums bear no comparison in point of appearance with the new double-flowered varieties for which we are mostly indebted to that very skilful hybridist M. Lemoine, of Nancy.

These new double-flowered varieties all belong to the true *peltatum* or trailing species, and are of various shades of colour, from almost pure white to dark lilac.

*** denote First-class Certificates.

A. F. BARRON*** (Lemoine). Flowers large and very double, of a pale rosy lilac colour, with dark veins on the upper petals; forms a large truss. A very fine variety. Flowers of the largest and finest forms.

*Elfrida**** (Ebert). Flowers large; dark lilac, shaded with purple; of fine form. Trusses of medium size. Very free flowering. A pleasing lively coloured variety, the darkest shade.

Konig Albert (Liebmann). Flowers of medium size, purplish lilac, very free flowering.

*Lucie Lemoine**** (Lemoine). Flowers large, rather loose; of a very pale lilac colour, with dark veins on the upper petals. Free flowering.

La Fiancée (Lemoine). Flowers of medium size, of a pale lilac colour; somewhat darker than A. F. Barron, but inferior. Rather shy flowering.

Madame Emille Gallé (Lemoine). Very similar to Sarah Bernhardt.

Madame Perle (Lemoine). Flowers of medium size, very full and compact, of a dark lilac colour. Trusses compact. Fine compact habit and free flowering.

*Mademoiselle Adrienne Barat**** (Lemoine). Flowers large and very double, pale lilac. Very free flowering and fine habit.

Rénoncle (Lemoine). Flowers of medium size, very double, very pale lilac.

*Sarah Bernhardt**** (Lemoine). Flowers almost white, the upper petals veined and tinged with lilac. Free flowering. Robust growth.

*Viscountess Cranbrook**** (Lemoine). Flowers large and full; white, shaded with rosy lilac colour. A pretty variety. Free flowering.

Classification of Varieties according to Colour.

FLOWERS WHITE OR VERY PALE LILAC.

<i>Lucie Lemoine.</i>	|	<i>Sarah Bernhardt.</i>
<i>Madame Emille Gallé.</i>	|	<i>Rénoncle.</i>
<i>Viscountess Cranbrook.</i>		

FLOWERS PALE LILAC.

<i>A. F. Barron.</i>	|	<i>La Fiancée.</i>
<i>Mademoiselle Adrienne Barat.</i>		

FLOWERS DARK LILAC.

<i>Elfrida.</i>	|	<i>Madame Perle.</i>
<i>Konig Albert.</i>		

XXIV.—REPORT ON Abutilons Grown for Trial by the Floral Committee, at Chiswick, 1878. By A. F. BARRON.

THE following varieties, submitted for trial, were presented to the Society by Messrs. Bull, Fraser, Williams, Van Houtte and Veitch, those from M. Lemoine being purchased. They were all propagated from cuttings in early spring, and grown and flowered in pots in a cool greenhouse. For this purpose few plants can be more highly recommended, or are better adapted for the autumn decoration of the conservatory. Good plants planted out early in June will grow and flower well, and are very suitable for the sub-tropical garden.

Classification as to Colour of Flowers, &c.

FLOWERS WHITE.

Boule de Neige.

FLOWERS YELLOW.

Lemoinei.

|

Perle d'Or.

Reine d'Or.

FLOWERS LILAC.

Anna Crozy.

|

lilacea alba.

Comtessa de Medici Spada.

|

Louis Marignac.

Souvenir de Maximillian.

FLOWERS ROSE.

Alphonse Karr.

|

Le Progrès.

Darwini robustum.

|

rosaeflorum.

Le Grélot.

|

roseum floribundum.

Simon Delaux.

FLOWERS ORANGE.

Darwini.

|

Darwini majus.

Darwini compactum.

|

Darwini tessellatum.

Darwini grandiflorum.

|

La Lorraine.

Prince of Orange.

FLOWERS PURPLE.

insigne.

|

Louis van Houtte.

Souvenir de St. Maurice.

FLOWERS STRIATED, YELLOW.

<i>Beranger.</i>	<i>striatum.</i>
<i>Montgolfier.</i>	<i>striatum variegatum.</i>
<i>niveum marmoratum.</i>	<i>Thompsoni.</i>

FLOWERS YELLOW, CALYX COLOURED.

<i>Megapotamicum.</i>	<i>Megapotamicum venosum.</i>
<i>Megapotamicum variegatum.</i>	<i>veixillarium.</i>

VARIETIES. WITH VARIEGATED LEAVES.

<i>Darwini tessellatum.</i>	<i>Sellowianum marmoratum.</i>
<i>niveum marmoratum.</i>	<i>striatum variegatum.</i>
<i>Megapotamicum variegatum.</i>	<i>veixillarium.</i>

1. *Anna Crozy* (Bull). Plant of robust, vigorous growth ; fine habit ; flowering freely late in the season ; good for winter flowering. Leaves large, broad. Flowers large, and of finely cupped form ; pale lilac, with dark veinings. Very pretty.
2. *Alphonse Karr* (Lemoine). Plant of tall, free growth, and fine branching habit. Leaves small, deeply cut. Flowers small, of fine rounded form, borne on long slender stalks ; colour reddish-orange, with dark veinings. Free flowering.
3. *Beranger* (Van Houtte). Plant of tall, erect habit of growth ; not branching. Leaves large, deeply cut. Flowers very large and elongated, of a clear pale orange colour, beautifully streaked with dark brown. Very showy, but somewhat shy flowering.
4. *Boule de Neige*. Plant of fine free branching habit. Leaves of medium size, somewhat pointed. Flowers of medium size, of finely cupped form ; pure white. Very free flowering. Excellent.
5. *Comtessa de Medici Spada* (Van Houtte). Plant of strong, robust growth. Leaves large, woolly. Flowers of medium size ; pale lilac. Very shy flowering. Worthless.
6. *Darwini* (Lemoine) (Fraser). Plant of free, vigorous growth.

Leaves large, broad. Flowers bright orange, with darker veinings; fine cupped form. Not free flowering.

7. *Darwini compactum* (Lemoine). A compact growing, free flowering variety. Flowers reddish-orange. Inferior.
8. *Darwini grandiflorum* (Bull). Plant of fine habit. Leaves large. Flowers very large, of longish form, of a pale orange colour, with dark veins. Free flowering and good.
9. *Darwini majus* (Lemoine) (Bull). Plant of smaller growth, but in other respects very similar to *D. grandiflorum*.
10. *Darwini robustum* (Lemoine). Plant of fine, compact habit. Free flowering. Flowers orange, shaded with rose; of fine form. Distinct and good.
11. *Darwini tessellatum* (Veitch). Plant of fine, robust habit. Very free flowering. Flowers bright orange, similar to *Darwini*. Leaves large, broad; beautifully variegated, or marbled; light green and yellow. A very ornamental plant, whether in or out of flower.
12. *Duc de Malakoff* (Fraser). Plant tall; free growing. *Not flowered*.
13. *insigne* (Williams) *syn. igneum*. Plant of tall, free growth. Leaves large, heart shaped; very thick and rugose; deep green; stem covered with short brown hairs. Flowers borne on long and slender panicles; the petals short, broad, much reflexed, of a dark purplish-crimson colour, with dark venations. A late Autumn or Winter flowering species. Very distinct and beautiful.
14. *La Lorraine* (Bull). Very similar to *Darwini grandiflorum*.
15. *Le Progrès* (Bull). Very similar to *roseum floribundum*.
16. *Le Grélot* (Bull). Plant of fine, compact habit. Free flowering. Flowers large, and rather long; finely cupped; of a pale rose colour, with dark venation. A very beautiful variety.
17. *Lemoinei*. Plant of fine, free habit. Leaves large, somewhat pointed and toothed. Free flowering. Flowers large;

pale yellow ; of finely cupped form, borne on short stalks. A very fine variety.

18. *Lemoinei* (Van Houtte). Same as Duc de Malakoff, of Fraser.
19. *lilacea alba* (Bull). Plant of vigorous growth. Flowers large, of a pale lilac colour ; finely cupped form. Very pretty, but considered inferior to Louis Marignac.
20. *Louis Marignac**** (Bull) (Lemoine). Plant of fine habit. Very free flowering. Flowers large, of finely rounded cupped form ; clear pale lilac colour, with slight venations. Very pretty. Distinct. One of the best.
21. *Louis van Houtte* (Bull). Plant of compact habit of growth. Free flowering. Flowers large, of fine cupped form, but somewhat rough ; dark purple colour, with white throat. Distinct and beautiful.
22. *Montgolfier* (Van Houtte). Plant of tall, free growth. Leaves large, deeply cut and pointed. Free flowering. Flowers large, much expanded, of loose form ; of a dull pale yellow colour. Worthless.
23. *Megapotamicum* (Van Houtte). Plant of slender, spreading habit. Leaves small and pointed. Flowers small, bell-shaped, and singularly beautiful, the calyx being dark red, the corolla pale yellow, and the stamens dark brown, in very pleasing contrast.
24. *Megapotamicum variegatum* (Van Houtte). A variegated-leaved form of the preceding.
25. *Megapotamicum venosum* (Van Houtte). A very tall, strong growing variety of *Megapotamicum*.
26. *Niveum marmoratum*. Plant of free growth. Leaves large, broad, downy, beautifully marbled pale green and yellow. Flowers of medium size and loose form ; yellow, streaked with dark orange. Valuable as a handsome foliage plant, and very suitable for bedding.
27. *Perle d'Or* (Bull). Fine dwarf growing habit. Free flowering. Flowers of fine rounded cupped form ; of a pale primrose colour. Very pretty. A good variety.

28. *Prince of Orange* (Williams). Plant of compact growth. Leaves dark green. Very free flowering. Flowers of fine form; bright orange colour. A very good variety.
29. *Reine d'Or**** (Veitch). Plant of tall, robust growth. Leaves very large; deep green. Flowers of a bright golden yellow colour, large, long, somewhat crumpled, and borne on long stalks. Very beautiful.
30. *rosaeflorum* (Williams). Plant of fine compact branching habit. Very free flowering. Flowers small, rounded, and of even form; bright rosy orange colour.
31. *roseum floribundum* (Van Houtte). Plant of fine, dwarf compact habit. Free flowering. Flowers small; pale rosy orange.
32. *rubrum multiflorum* (Van Houtte). Plant of tall, strong growth. Leaves large. *Not flowered*.
33. *Souvenir de St. Maurice* (Lemoine). Plant of fine, compact dwarf habit. Leaves small. Free flowering. Flowers of medium size, of finely cupped form; dark purplish colour. Excellent. Very similar to Louis van Houtte.
34. *Souvenir de Maximilian* (Van Houtte). Plant of strong, vigorous growth. Leaves large, broad, not lobed. Shy flowering. Flowers very large; pale lilac, veined. Distinct.
35. *Souvenir de Couchy* (Van Houtte). Plant of dwarf, compact habit. Distinct in appearance. *Not flowered*.
36. *Simon Delaux* (Bull). Plant of tall, growing habit; branching. Flowers small; pale rose. Inferior to Le Grélot, which it greatly resembles.
37. *Sellowianum marmoratum* (Veitch). Plant of fine habit, robust growth. Leaves large, from 6 to 7 inches in diameter, very downy, and beautifully marbled pale yellow and green. A very handsome, ornamental foliaged plant. Requires stove treatment.
38. *striatum*. Plant of tall, erect growth, not inclined to branch. Leaves large, deeply lobed, smooth. Flowers of medium size, very beautifully streaked yellow and orange.
39. *striatum variegatum*. A variegated leaved variety of the preceding. Useful for bedding.
40. *Thompsoni*. Same as *Striatum variegatum*.
41. *vexillarium*. Very similar to *Megapotamicum variegatum*. Makes a fine ornamental plant grafted on stems from 1 to 2 feet in height.

XXV.—REPORT on Cabbages Grown for Trial by the Fruit and Vegetable Committee of the Royal Horticultural Society, at Chiswick, in 1877—78. By A. F. BARRON.

THE number of truly distinct or typical varieties of Cabbages is not very extended, but their variability of character and appearance has led at all times to an almost endless multiplication of names, which are most confusing and misleading. The necessity for some arrangement and classification of the numerous names of Cabbages found in trade catalogues which has long been apparent, induced the Fruit Committee to institute a most comprehensive trial under the same conditions of all the varieties and supposed varieties that could be procured.

The collections under trial, numbering 187 distinct samples and no less than 150 different names or synonymes, were received from the following seedsmen, &c. :—Messrs. Barr and Sugden, Messrs. Carter and Co., Messrs. Minier, Nash and Nash, Messrs. Nutting and Son, and Messrs. Veitch, of London; Messrs. Harrison, of Leicester; Messrs. Stuart and Mein, of Kelso; Messrs. Wheeler, of Gloucester; and W. J. Ellam, MM. Vilmorin, of Paris; M. Leroy, of Angers; Herr Benary, of Erfurt; and Herr Dippé, of Quedlinburg, Germany.

Two trials or examinations were made. *Firstly*, from seed sown early in March, the Cabbages coming in for use in autumn. This formed the most comprehensive trial, the most of the varieties showing their peculiar characteristics to great advantage at this season, the cool moist autumn weather being extremely favorable to their proper development. At this trial the greater part of the synonymes, &c., were determined, and their adaptability or otherwise for autumn use noted. *Secondly*, from seed sown in July, the Cabbages coming in for use the early part of the following summer. In this trial the synonymes previously determined were not included, the typical or distinct sorts chiefly being tested, including all those of doubtful character which were not satisfactorily arranged at the autumn examination. In this way the whole of the typical varieties were tested twice, both as summer and autumn Cabbages, and their proper seasons noted.

For convenience and simplification the whole of the Cabbages have been arranged in three general classes, as follows, which are fairly well defined :—

1. **Garden Cabbages, or varieties suitable for garden culture.** This is the principal class, and includes all the smaller and finer forms of the Cabbage which mostly form their hearts quickly, and are of good quality. Those that are cultivated for the leaf stalks chiefly are distinct species, the flowers being white instead of yellow.
2. **Field Cabbages, or varieties suitable for growing in fields for cattle.** This class includes all the large growing and coarser varieties, generally termed Dutch or Drumhead. In a horticultural sense these are of inferior importance to the garden varieties, and need not have been tested at all excepting for the purpose of classification. Their peculiar merits cannot be determined by garden cultivation, although some of them in certain stages and seasons may be very serviceable.
3. **Red or Pickling Cabbages.** This class is sufficiently well defined to require no explanation. Being of a red or purplish colour, they are, on that account, preferred for pickling to the green varieties.

From these three general classes the various types or typical varieties—that is, such varieties as appeared to possess sufficiently distinct features of a permanent character—have been selected and carefully described; photographs were also taken of the entire number for future reference, the oldest and most generally adopted name being in all cases preferred. Varieties under other names which were considered identical are given as synonymes, and those varying somewhat, either as to size or season, &c., but possessing the same general characters, are given as selections or varieties. Thus, in the Early York type, the Tom Thumb Early Dwarf is but a finer selection, and in the Nonpareil type, although there is a decided difference in the general appearance of the finer forms of Carter's Heartwell and Wheeler's Cocoa Nut, for all practical purposes they are properly classed as varieties of the Nonpareil.

In this way the whole of the varieties of Cabbages have been reduced to the comparatively small number of

Garden Cabbages	...	...	21	Typical Varieties.
Field Cabbages	...	...	16	" "
Red or Pickling Cabbages			2	" "

The great tendency of the whole of the Cabbage tribe to variation of character is pretty well understood by most good cultivators and seed-growers. It is a matter of selection, good or bad stocks, early or late forms, large or small, &c., &c., being readily produced according to the attention bestowed in the saving of the seed. True or pure stocks are only maintained by the most careful and constant selection of the particular form desired, and the saving of the seed. Seasons, however, and soils also, alter the appearance of Cabbages very much; also the periods of sowing and of planting. The produce, for example, from the same bag of seed may one season be very true, whilst in the next they appear mixed—some late—some early, &c., &c. Some of these variations being considered improved forms, are selected, a new name is given, and so new (?) varieties are introduced.

CLASSIFICATION OF CABBAGES.

CLASS I.

Garden Cabbages, or Varieties suitable for Garden Culture.

1. ATKINS'S MATCHLESS.
2. BACALAN.
Variety. Late Bacalan.
3. EARLY BOULOGNE.
Synonym. Prefin de Boulogne.
4. EARLY YORK.
Synonym. Small Oxheart.
Varieties or Selections. { Superfine Early.
Tom Thumb Early Dwarf.
Early Dwarf York.

5. ENFIELD MARKET.

Division 1, Early Stocks.

Varieties or Selections.	{	Sprotboro.
		Raymeadow.
		Improved Cabbage.

Division 2, Large Late Stocks.

Ditto	{	Daniel's Defiance.
		Early Battersea.
		Wright's Market.
		Harrison's Victoria.
		Victoria.
		Plaw.

Division 3, Ordinary Stocks.

Ditto	{	Blenheim.
		East Ham.
		David's No. 1.
		Myatt's Early.
		Large Nonpareil.
		McEwen's Early.
		Kemp's Incomparable.
		Early Rainham.
		Cattell's Reliance.
		Vanack.
		Jersey Wakefield.

6. HARDY GREEN COLEWORT.

Synonym.	Large Green Colewort.
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7. LARGE YORK.

Synonym.	Oxheart Large.
	Cœur de Bœuf gros hâtif.
Varieties or Selections.	{ Early Large York.
	{ Large York.
	{ Oxheart.

8. LITTLE PIXIE.

Synonyms.	{	Oxheart Early.
		Cœur de Bœuf petit.
		Normandy.
		Early Normandy.
Varieties or Selections.	{	Louviers.
		Précoce de Louviers.

9. NONPAREIL.

Division 1, Early Stocks.

Varieties or Selections.	{	Dwarf Early. Carter's Heartwell. Heartwell. Wheeler's Imperial.
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Division 2, Smooth Leaved Stocks.

Ditto	{	Cocoa Nut. Wheeler's Cocoa Nut. Monarch. Oliver's Monarch.
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10. PROMPT DE ST. MALO.

11. POMERANIAN.

Synonym. Fielder.

12. POMME D'ORION.

13. TOURLAVILLE.

Early Ingreville.
Ingreville.

14. ROSETTE COLEWORT.

Synonym. Rose Colewort.

15. ST. JOHN'S DAY.

Synonyms.	{	St. John's Day Drumhead. St. John's Day Early Drumhead. Chou Joannet.
Varieties or Selections.	{	St. John's Day Late Drumhead. St. John's Day Early. Large St. John's Day. Drumhead Early Dutch.

16. SUGAR LOAF.

17. WINNIGSTADT.

Synonym. Early Winnigstadt.

A.—Varieties cultivated for their Leafstalks or Midribs.

18. COUVE TRONCHUDA.

Synonyms.	{	Tronchuda. Portugal. Braganza. Couve Pucco.
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19. CURLED TRONCHUDA.

20. COUVE MURCIANA.

21. CORNISH.

Synonym. Paington.

CLASS II.

Field Cabbages, or Varieties suitable for Cattle or Field Culture.

1. BLEICHFIELD GIANT.

Synonym. Early Bleichfield.

2. BRUNSWICK.

Varieties or Selections.	{	Large Brunswick Short Stemmed.
		Large Late Flat Brunswick.
		Fottler's Brunswick.
		Silver Leaf Drumhead.

3. DAX DRUMHEAD.

Synonym. De Dax.

4. ERFURT DRUMHEAD.

5. FUMEL.

Synonym. Femelle.

6. HABAS DRUMHEAD.

7. LATE FLAT DUTCH, OR DRUMHEAD.

Varieties or Selections.	{	American Early.
		Early American.
		Erfurt Large White.
		Erfurt Small White.
		Gibson's Drumhead.
		Henderson's Early.
		Large White Brunswick.
		Large White Solid Magdeburg.
		Late Purple Flat Pall.
		Marbled Headed Mammoth.
		Premium Flat Dutch.
		Robinson's Champion Drumhead.
		Van Winkler's Flat Dutch.
		Marbled Burgundy.
		Glen Dwarf Drumhead.

8. MONK'S CABBAGE.

Synonym. Large Erappe Drumhead.
Erappe Drumhead.

9. MORTAGNE.

Synonym. Large Mortagne Drumhead.

10. QUINTAL.

Synonyms. { Flat Dutch Drumhead.
Carter's Improved Drumhead.
Strasburg Quintal.
Dwarf Drumhead.

11. SCHWEINFÜRTH.

Synonyms. { Schweinfürth Early Drumhead.
Schweinfürth Quintal.
Large White Schweinfürth.

12. ST. DENIS.

Synonym. St. Denis Large Drumhead.

13. VAUGIRARD.

B.—Varieties partaking of the Borecole character, producing but little heart.

14. FEARNOUGH.

15. THICK LEAVED.

16. GREEN GLAZED AMERICAN.

Synonym. Glazed Cabbage.

CLASS III.

Red or Pickling Cabbage.

1. DARK RED DUTCH.

Varieties or Selections. { Dark Red Erfurt.
Early Dark Red Erfurt.
Erfurt Blood Red.
Small Red.

2. RED DUTCH.

Varieties or Selections. { Drumhead Red.
Large Red Drumhead.
Large Red.

1. *Atkins's Matchless* (Nutting and Sons; Minier and Co.; Veitch and Sons). Plant of a dwarf, compact habit of growth. About 9 inches high. Leaves, the outer about 18 inches broad, spreading, somewhat crumpled; of a very

- dark green colour. Heart small, broad at base, tapering to a sharp point, very firm and solid. This is a very distinct variety of a deep green colour, varied only by slight shading of red on the edges of the outer leaves at times. An excellent small early Cabbage for autumn use.
2. *American Early*. See Early American.
 3. *Blenheim* (Nutting and Sons). See Enfield Market. Good stock.
 4. *Bacalan* (Carter and Co.; Vilmorin). Plant of tall, strong but compact growth; from 16 to 18 inches high, with long stem. Leaves broad, thick, incurving, with the edges reflexed, and wavy in outline. Hearts large, obovate in shape; from 6 to 8 inches in diameter; very solid and excellent. A very handsome and distinct Cabbage. Succeeds either for autumn or spring sowing.
 5. *Bacalan, late* (Carter; Vilmorin). A somewhat later form of the preceding.
 6. *Battersea*. See Enfield Market.
 7. *Bleichfield Giant* (Benary). Plant dwarf, resting on the ground. Leaves large spreading, having a bright green shining appearance. Hearts large, flat, and solid, like St. John's Day; very tender and excellent. A very fine early variety of the Drumhead, suitable for autumn use. Sow in spring.
 8. *Bloomsdale Early* (Carter). This sample contained a mixture of several varieties.
 9. *Brunswick* (Dippé Bros.) Inferior stock. See Large Brunswick.
 10. *Braganza*. See Couve Tronchuda.
 11. *Carter's Heartwell*. See Heartwell or Nonpareil.
 12. *Cattell's Reliance* (Veitch and Sons). See Enfield Market.
 13. *Chou Joannet* (Vilmorin). See St. John's Day.
 14. *Cocoa Nut*, Wheeler's (Carter; Nutting; Minier). See Nonpareil. This is a very fine smooth rounded leaved selection of the Nonpareil, of fine regular conical form.
 15. *Cornish* (Nutting). Plant tall, having a stout stem of about 8 inches. Leaves large, spreading with wavy serrated outlines; light green in colour. The inner leaves much crumpled and serrated, forming a loose heart. This is a variety of Cabbage much cultivated and esteemed

in Cornwall for its thick fleshy midribs, but it is much inferior in this respect to the Couve Tronchuda.

16. *Cœur de Bœuf petit* (Leroy). See Little Pixie.
17. *Cœur de Bœuf gros hâtif* (Leroy). See Large York.
18. *Couve Tronchuda* (Carter; Vilmorin). Plant of medium size, on short thick stem. Leaves, the outer large, broad, with short very thick fleshy stalks and midribs; the colour pale green, with the ribs pure white; hearts very irregularly formed, but sometimes very solid. This is a variety of Cabbage largely grown about Braganza in Portugal, and is of excellent and distinct quality. The fleshy midribs of the leaves are the only parts eaten, being cooked like seakale. It is somewhat tender; requires to be sown early in spring for use in autumn. Flowers white.
19. *Couve Murciana* (Barr and Sugden). Plant tall, loose growing; leaves large, deep green, with thick fleshy midribs; forms a loose heart. This is allied to C. Tronchuda, but much inferior.
20. *Couve Pucco* (Barr and Sugden). See Couve Tronchuda.
21. *Curled Tronchuda* (Vilmorin). Plant of tall robust growth. Leaves spreading on long thick stalks; much cut and feathered down the stalk, waved and curled along the edges, which are deep green, with the palm flat, and almost white; very thick and fleshy. This is very distinct from the Couve Tronchuda, and much inferior, but is often substituted for it.
22. *Daniel's Defiance* (Nutting and Son). See Enfield Market. Fine selection.
23. *David's No. 1* (Nutting and Son). See Enfield Market.
24. *Dwarf Drumhead* (Nutting; Veitch). See Quintal Drumhead.
25. *Dwarf Early* (J. Ellam). See Nonpareil. A very fine selection.
26. *De Tournalville* (Vilmorin; Carter & Co.) Plant of tall robust growth, on long stem. Leaves medium sized, roundish, on long stalks; deep green. Forms large hearts quickly, which are about 7 inches in diameter, of obovate form, very firm and solid. A distinct variety. Stock not very pure.
27. *De Mortagne* (Carter & Co.) Plant dwarf on very short stem. Leaves spreading, the outer broad, flat and smooth,

the inner somewhat cupped or closing over the hearts; of a pale glaucous green colour, faintly tinged with purple. Hearts large, 8 inches in diameter, flat, very firm and solid; forms early, and keeps long in good condition. Allied to the Drumhead section.

28. *Dark Red Dutch* (Vilmorin). A very early variety of Red Cabbage; hearts small, deep purplish red, fleshy, crisp and excellent. Sow in spring for autumn.
29. *Dark Red Erfurt* (Vilmorin). Similar to *Dark Red Dutch*. Fine variety.
30. *Dax Drumhead* (Carter; Vilmorin). Plant very dwarf, resting on the soil. Leaves very large, broad, spreading, somewhat crumpled and cockled; of a light green colour; hearts formed quickly, very broad and quite flat, not very solid; very crisp and tender. Very much resembles *Habas Drumhead*.
31. *Drumhead*. See *Late Flat Dutch*.
32. *Drumhead Early Dutch* (Vilmorin). See *St. John's Day Late*.
33. *Drumhead Red* (Nutting & Son). See *Red Dutch*.
34. *East Ham* (Carter; Minier; Nutting). See *Enfield Market*.
35. *Earliest French* (Carter). This sample contained a mixture of several varieties.
36. *Early American* (Veitch). A large and very early variety of the Drumhead section. Hearts somewhat more pointed than the ordinary form. Excellent.
37. *Early Battersea* (Minier). See *Enfield Market*.
38. *Early Boulogne* (Carter & Co.) Plant of small, compact growth; height 10 inches. Leaves small, rounded, spreading and curving backwards from the heart, which thus appears to stand very bare. The leaves are thick, with longitudinal white, fleshy veinings; hearts small, of conical shape, with broad base; very firm, crisp and tender. This is the earliest of all the Cabbages, but soon bursts, and is inferior to others which are a little later.
39. *Early Bleichfield Giant* (Benary). See *Bleichfield Giant*.
40. *Early Dutch Drumhead* (Vilmorin). See *St. John's Day Late*.
41. *Early Dark Red Erfurt* (Vilmorin). A small but early variety of *Dark Red Dutch*.

42. *Early Ingreville* (Carter). See De Tourlaville.
43. *Early Dwarf York* (Minier). See Early York. A very fine selection.
44. *Early York* (Carter; Nutting; Veitch; Vilmorin). Plant of small compact growth on a short slender stem; height averaging from 10 to 12 inches. Leaves few, erect, of rounded form, and slightly cupped; very smooth and even; of a deep green colour, with a thick coating of bloom and a few white venations. Hearts small, formed very quickly, of an ovate form with a rounded top; very firm and solid. A very distinct type of Cabbage of very excellent quality. Summer and autumn use. To be sown in spring.
45. *Early Large York* (Minier). See Large York, of which this is an early selection, and having the leaves glossy.
46. *Early Normandy* (Carter). See Little Pixie.
47. *Early Wyman* (Carter). A mixed stock.
48. *Early Rainham* (Minier). See Enfield Market.
49. *Early Jersey Wakefield* (Veitch). See Jersey Wakefield.
50. *Early Winnigstadt* (Veitch). See Winnigstadt.
51. *Enfield Market* (Carter; Minier; Veitch). Plant large on short stem. Leaves large, broad, frequently much cockled, and with thick fleshy ribs; bright green in colour. Hearts large, broadly obovate and irregularly pointed; very solid, crisp and tender. This is the great London market Cabbage, and the one most generally cultivated throughout the country under many names, which differ only in proportion to the purity of stock and early or late selections. Formerly it was better known as Vanack, subsequently Fulham or Battersea, but at the present time Enfield Market is the best known; hence its adoption.
52. *Erfurt Blood Red Earliest* (Benary). See Dark Red Dutch. A small and fine selection; very early.
53. *Erfurt Large White* (Benary). A large and fine late variety of the Drumhead.
54. *Erfurt Small White* (Benary). A mixed and inferior stock of Drumhead or Brunswicks.
55. *Erappe Drumhead* (Vilmorin). See Monk's Cabbage.
56. *Fearnought* (Carter). Plant of strong robust growth, about two feet in height, spreading. Leaves on long stalks; narrow, much waved and irregular in outline like Broccoli;

of a deep green colour, the ribs reddish. Hearts small, very loosely formed. A very hardy sort, but very coarse and worthless.

57. *Fielder* (Benary). See Pomeranian.
58. *Flat Dutch Drumhead* (Minier). See Quintal.
59. *Fottle's Brunswick* (Carter; Stuart and Mein). See Large Brunswick.
60. *Fumel* or *Femelle* (Vilmorin; Carter). Plant rather short, spreading. Leaves large, rounded, on long stalks; much crumpled; of a very pale green colour, and very soft in texture. Hearts very large, broad, flat like the Drumhead; very loose. This is a very peculiar and distinct Cabbage. Hearts form very early, but soon open out again and run to seed.
61. *Glazed Cabbage* (Carter). See Green Glazed American.
62. *Gibson's Drumhead* (Nutting). See Large Brunswick.
63. *Glen Dwarf Drumhead* (Nutting). See Drumhead.
64. *Green Glazed American* (Vilmorin). Plant tall, on long stem. Leaves few, medium sized, rounded, of a shining deep green colour. Forms very small hearts. Can scarcely be termed a Cabbage, more properly a Borecole. Much appreciated in America, where it is almost exclusively grown.
65. *Heartwell* (Carter). A very fine close growing selection of the Nonpareil.
66. *Habas Drumhead* (Carter; Vilmorin). Plant very dwarf, resting on the soil. Leaves large, about $2\frac{1}{2}$ feet in diameter, lying flat, much crumpled, of a very pale green colour, and very thin and tender. Hearts form quickly, very broad and flat, frequently 10 to 12 inches, and not more than 2 inches in thickness. Very soft and rather tender. A very pretty and distinct early flat Cabbage.
67. *Hardy Green Colewort* (Carter; Veitch). Plant of compact growth; about 12 inches in height. Leaves of medium size, of a very deep green colour, with a tinge of red. Hearts formed very slowly and late, medium size, of a broad conical form. An excellent variety for late autumn use; very hardy. It is generally sown in May, planted out thickly for use in autumn and winter, as Coleworts or Greens. Very fine quality.

68. *Henderson's Early* (Carter). A variety of the Drumhead. Inferior.
69. *Improved* (Stuart and Mein). An early selection of Enfield Market; very good.
70. *Improved Drumhead* (Carter). See Quintal.
71. *Ingreville* (Vilmorin). See De Tournalville.
72. *Jersey Wakefield* (Carter; Veitch). A large strong growing form of the Enfield Market type, but much coarser and inferior.
73. *Kemp's Incomparable* (Carter & Co.) See Enfield Market.
74. *Large Brunswick Short Stemmed* (Vilmorin). Plant very dwarf, almost resting on the ground. Leaves very large, broad, lying flat on the surface, very thick and smooth; of very pretty pale glaucous green. Hearts large, flat, averaging about 10 inches in diameter. Very smooth, even, and regularly formed, and very firm. Hearts form early, and keep long in good condition. A very good variety of the Drumhead type.
75. *Large Late Flat Brunswick* (Vilmorin). See large Brunswick Short Stemmed.
76. *Large White Brunswick* (Benary). See Late Flat Dutch.
77. *Large Erappe Drumhead*. See Monk's Cabbage.
78. *Large Green Colewort* (Minier). See Hardy Green Colewort.
79. *Large Mortagne Drumhead* (Vilmorin). See De Mortagne.
80. *Large Oxheart* (Vilmorin). See Large York.
81. *Large St. John's Day* (Carter). See St. John's Day Late.
82. *Large White Solid Magdeburg* (Benary). A good selection of Drumhead or Flat Dutch.
83. *Large White Schweinfürth* (Benary). See Schweinfürth.
84. *Large Red Drumhead* (Vilmorin). See Red Dutch.
85. *Large Red* (Carter). See Red Dutch.
86. *Large Nonpareil* (Nutting). See Enfield Market.
87. *Large York* (Carter; Vilmorin). A large tall growing form of the York Cabbage, of exactly similar appearance to the Early York, but growing to more than twice its size. Very excellent. This is the large Oxheart of the French.
88. *Large York* (Veitch; Nutting). An early hearting form of Large York, having the leaves glossy or shining and destitute of the usual bloom.
89. *Late Bacalan* (Carter; Vilmorin). See Bacalan.

90. *Late Flat Dutch* (Vilmorin). Very large, and strong growing. Heads very large, solid; pale green. This is the ordinary Drumhead Cabbage, much grown in fields for cattle.
91. *Late Purple Flat Poll* (Nutting). A large and late variety of Drumhead.
92. *Little Pixie* (Carter; Nutting; Veitch). Plant of very small, close compact growth, averaging about 8 inches in height. Leaves short, rounded, smooth; of a light green colour. Hearts large for size of plant, of conical form, with a broad base and rounded points. Hearts form very early, and are of excellent quality. Good for late summer and autumn use. Sow in spring; may be planted 15 inches apart. This is the same as the small Oxheart of the French.
93. *Louviers* (Vilmorin). A larger form and very fine selection of Little Pixie. Very good.
94. *Marble Headed Mammoth* (Carter). See Late Flat Dutch.
95. *Marbled Burgundy Drumhead* (Vilmorin). See Late Flat Dutch.
96. *McEwen's Early* (Nutting). See Enfield Market.
97. *Monarch* (Nutting). See Nonpareil.
98. *Monk's Cabbage* (Carter). Plant large, spreading on a short stem. Leaves, the outer broad flat, the inner much cupped and somewhat reflexed; very thick and of deep glaucous green colour. Hearts large, roundish, flattened, from 7 to 8 inches in diameter; very deep green, tinged with red; very solid yet crisp and tender. A fine and handsome late Cabbage, Drumhead type.
99. *Wyatt's Early* (Nutting). See Enfield Market.
100. *Nonpareil* (Carter; Minier; Nutting; Veitch). Plant dwarf, seldom exceeding 12 inches in height; of close compact growth. Leaves light green, of medium size, rounded at the point, somewhat cockled and crumpled. Hearts of broad conical form, from 4 to 6 inches in diameter, formed very early, very firm and solid, and of excellent quality. One of the most esteemed of Cabbages for general use. Not quite so large as Enfield Market, but of much the same character. The larger forms of the one may pass for the other, and *vice versa*.
101. *Normandy*. See Little Pixie.
102. *Oxheart Early* (Vilmorin) See Little Pixie.

103. *Oxheart* (Carter). See Large York (Veitch).
104. *Oxheart Large* (Vilmorin). See Large York.
105. *Oliver's Monarch* (Stuart and Mein). See Nonpareil.
106. *Paignton* (Nutting). See Cornish.
107. *Plaw* (Nutting and Son). See Enfield Market.
108. *Pomeranian* (Carter ; Vilmorin). Plant tall, averaging from 2 to 2½ feet, on long stem. Leaves large, of long pointed form and of a pale glassy green colour. Heads of long conical form, sharply pointed, averaging from 14 to 16 inches, and from 6 to 8 inches in diameter ; very solid and of good quality. A very distinct variety, the long pointed heads being very remarkable. Sown in autumn, becomes fit for use the following summer. An excellent sort in dry seasons.
109. *Pomme d'Orion* (Leroy). Plant large, spreading, on short stem. Leaves large, broad, spreading, with a wavy outline, and somewhat reflexed, thus exposing and showing the heart rather conspicuously ; hearts of medium size, obovate pointed, very fleshy, tender, crisp and moderately solid. A distinct variety but not of much merit.
110. *Portugal* (Barr & Sugden). See Couve Tronchuda.
111. *Prefin de Boulôgne* (Leroy). See Early Boulôgne.
112. *Précoce de Louviers* (Vilmorin). See Louviers.
113. *Premium Flat Dutch* (Carter). See Late Flat Dutch. A large late variety.
114. *Prompt de St. Malo* (Leroy ; Vilmorin). Plant tall and rather thin. Leaves long, narrow ; hearts large, of obovate pointed shape and of a light green colour ; the ribs very prominent and fleshy ; very solid, crisp and tender. An early Cabbage but stock very inferior.
115. *Quintal* or *Cwt. Drumhead* (Carter ; Vilmorin). Plant very dwarf, almost resting on the ground. Outer leaves large, broad, rounded, with wavy outline, those approaching the heart prettily reflexed along the edges, giving the plant a very distinct and handsome appearance. It is of a uniform light glaucous green colour ; the ribs white and very prominent ; hearts large, flat, averaging from 8 to 10 inches in diameter and from 2 to 3 inches in thickness ; very solid yet tender and excellent ; hearts form rapidly and keep well. One of the very best of the Drumhead section for garden cultivation.

116. *Raymeadow* (Wheeler). An early and fine selection of Enfield market.
117. *Red Dutch* (Minier; Nutting; Veitch). Plant tall, of strong vigorous growth. Leaves large, rounded, of a dull purplish red colour, very thickly covered with a greyish blue bloom; hearts large, very solid; of a very deep red colour. Excellent. This is the ordinary Red Cabbage.
118. *Robinson's Champion Drumhead* (Nutting). See late Flat Dutch.
119. *Rosette Colewort* (Carter; Minier; Veitch). Plant of a very distinct style of growth, small, compact. Leaves small, rounded, short, cupped or incurved and hooding over heart, thus forming a perfectly flat or square top; of a deep green colour tipped with rose; hearts small but becoming very firm if sown at the proper season. It should be sown in May and planted out about 15 inches apart for use in autumn as Coleworts or small Cabbages. If sown at other seasons it grows very differently and is much inferior. Much cultivated in the market gardens round London, and deservedly esteemed.
120. *Schweinfürth Quintal* (Vilmorin). Plant large and spreading, from 18 to 20 inches in height, on a short stem. Leaves thin, very large, broad, the outer flat and spreading, the others gradually becoming more cupped the nearer to the heart; colour pale green, shining or destitute of the usual bloom, the outer edges of the leaves tinged with dull red; hearts large or very large, roundish or obovate in shape, and seldom becoming very solid; may be easily crushed with the hands like a lettuce. This is a very early variety of the Drumhead section, but unsuited for gardens.
121. *Schweinfürth Early Drumhead* (Minier). See Schweinfürth Quintal.
122. *Silver Leaf Drumhead* (Carter and Co.) Plant dwarf, like Short stemmed Brunswick; heads large, flat. Leaves light green, tinged on the outer edges with dull red. Coarse.
123. *Small very Early Erfurt Drumhead* (Vilmorin). Plant dwarf, almost resting on the ground; greatly resembling St. John's Day, but inferior in texture and quality. Leaves small, rounded, smooth; hearts of medium size, flat, very

- smooth, evenly formed and very solid. A small early and very pretty variety of Drumhead.
124. *Sprotboro* (Nutting and Son ; Minier). See Enfield Market.
 125. *Small Red* (Carter). See Dark Red Dutch.
 126. *Small Oxheart* (Carter and Co.) See Early York.
 127. *St. Denis* (Carter). Plant dwarf, on a short stem, spreading. Leaves very large, thick, rounded, lying flat ; of a deep green colour, with a very thick blue bloom. Hearts large, roundish, very firm and solid, some having a tinge of brown, but generally of a uniform deep green. Forms early and keeps long in good condition. A very pretty Cabbage.
 128. *St. Denis Large Drumhead* (Vilmorin). See St. Denis.
 129. *St. John's Day* (Carter ; Nutting). Plant very dwarf, entirely resting on the ground, seldom exceeding 6 or 7 inches in height, and about 18 or 20 inches in breadth. Leaves spreading broad, very compactly placed ; of a deep green colour. Hearts large, broad, flat, from 6 to 8 inches in diameter ; very firm, solid, yet crisp, tender and fleshy. Forms early, and is of excellent quality. One of the very best Cabbages for autumn use. Sow in April and plant out 15 inches apart.
 130. *St. John's Day Early* (Minier). See St. John's Day Late.
 131. *St. John's Day Drumhead* (Veitch). See St. John's Day.
 132. *St. John's Day Early Drumhead* (Vilmorin). See St. John's Day.
 133. *St. John's Day Late Drumhead* (Vilmorin). A larger and later form of St. John's Day.
 134. *Strasburg Quintal* (Benary). See Quintal.
 135. *Sugar Loaf* (Carter ; Nutting ; Veitch ; Vilmorin). Plant of a very distinct character, of rather tall growth. Leaves long, erect, spoon-shaped, and much cupped ; of a very pale green colour, but covered with a thick bloom, and leathery texture. Hearts of long ovate shape, formed very loosely, the leaves merely hooding over in the manner of a loose Cos Lettuce, so may be easily unfolded. Forms early, but of poor quality, not worthy of cultivation.
 136. *Superfine Early* (Vilmorin). See Early York. A very fine selection.
 137. *Thick-leaved* (Carter ; Vilmorin). Plant of tall vigorous

growth, on long stem. Leaves large, spreading, very thick and leathery; of a pale green colour, with very prominent broad white midribs and veinings, giving the plant a very white appearance. The edges or borderings much waved in outline, and recurving over the heart very prettily. Hearts medium size, broad, very solid, but is apt to burst open rather quickly. A very distinct but coarse and uncertain variety.

138. *Tom Thumb Early Dwarf* (Minier). See Early York. A very fine selection.
139. *Tourlaville* (Vilmorin). See De Tourlaville.
140. *Tronchuda*. See Couve Tronchuda.
141. *Vanack*. See Enfield Market. Vanack is the old and original name of the Cabbage, now generally known as Enfield Market.
142. *Van Winkler's Flat Dutch* (Carter). See Drumhead or Flat Dutch.
143. *Vaugirard* (Carter; Leroy). Plant of medium height on short stem. Leaves large, broad, flat and smooth, very thick and fleshy, of a very deep green colour, with a thick heavy bloom, those near the heart somewhat waved and tinged with purple, like the red Cabbage. Hearts large, roundish, moderately firm and solid, but somewhat coarse.
144. *Vaugirard Winter Drumhead* (Vilmorin). See Vaugirard.
145. *Victoria, Harrison's* (Harrison). See Enfield Market.
146. *Wheeler's Cocoa Nut* (Wheeler). See Cocoa Nut or Nonpareil.
147. *Wheeler's Imperial* (Nutting; Veitch). See Nonpareil. A fine early selection.
148. *Winnigstadt* (Benary; Carter; Nutting; Veitch; Vilmorin). Plant of medium size on short thick stem. Leaves, the outer large, spreading, smooth; of a deep green colour, with a heavy bloom, and very thick and fleshy. Hearts very large, broad, conical and sharply pointed, the point frequently twisted somewhat on one side; very solid, and of excellent quality. A very distinct and excellent Cabbage for late summer and autumn use; should be sown in August, or very early in Spring.
149. *Winnigstadt Sugar Loaf* (Benary). See Winnigstadt.
150. *Wright's Market* (Minier). See Enfield Market.

Garden Cabbages arranged according to their seasons, representing all the types or typical varieties in cultivation :—

Early Varieties.

1. Atkins's Matchless.
2. Early Boulogne.
3. Early York.
4. Little Pixie.
5. Nonpareil.
6. St. John's Day.
7. Sugar Loaf.

Mid or General Season Varieties.

8. Enfield Market.
9. Large York.
10. Prompt de St. Malo.
11. Tournalville
12. Rosette Colewort.
13. Winnigstadt.

Late Varieties.

14. Bacalan.
15. Hardy Green Colewort.
16. Pomme d'Orion.
17. Pomeranian.

Selection of Cabbages, best adapted for sowing in spring, for an autumn supply, *those marked * being most recommended*:—

Atkins's Matchless.

* Early York.

Hardy Green Colewort.

Little Pixie.

* Nonpareil.

* Rosette Colewort.

* St. John's Day.

* Couve Tronchuda.

Selection of Cabbages best suited for sowing in autumn, for a spring and summer supply:—

Little Pixie.

Enfield Market.

Nonpareil.

Winnigstadt.

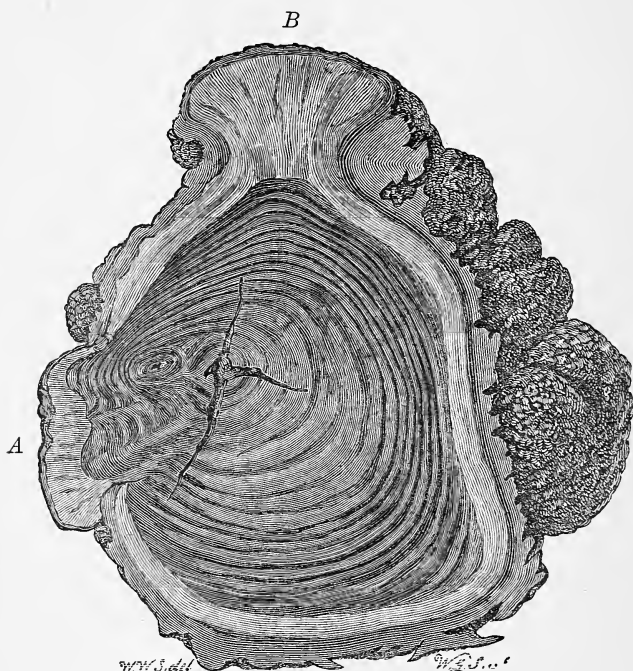
XXVI.—NOTES ON a Diseased Acacia (*Robinia pseudo-acacia*).

By W. WILSON SAUNDERS, F.R.S. (Read at meeting of Scientific Committee, 11th March, 1879.)

When at Torquay, a short time since, my attention was called by my friend E. Vivian, Esq., of that place, to a very remarkable diseased trunk and branches of an Acacia (*Robinia pseudo-acacia*), which he had planted in his grounds about the year 1842, on the north side of a wall 8 feet high, in clayey loam, with a subsoil of shale. The tree was cut down in 1870, on account of the disease stopping its growth and rendering it unsightly. I carefully examined the remains of this tree, and was furnished by Mr. Vivian, who is an excellent draughtsman, with a sketch of the trunk, and I was allowed to take branches of the tree for more rigid examination. I beg now to offer to the Scientific Committee of the Royal Horticultural Society carefully executed drawings of this diseased Acacia, with sections of the stem and branches, which will show the character of the disease, and to describe at the same time its peculiar features. So far as I was enabled to see the nature of the disease on the stem and branches preserved by Mr. Vivian, it appeared as a very regular eruptive growth of numerous more or less rounded nodulous excrescences, commencing at the very base of the main stem and extending to the very extremity of the branches. These excrescences were very unequal in size, very variable in outline, and very rough and nodulous. They often touched each other, and in places formed elongated somewhat transversely ribbed masses. Some of the more developed excrescences on the main stem protruded nearly two inches from the general line of the stem, while others on the branches were like large rough warts, with an elevation of only a quarter of an inch.

Referring now to the Drawings which accompany this, No. 1 shows a horizontal section of the main stem near the base, opening up two of the excrescences and showing others in profile. Here it will be perceived that the bark is thick, very rough externally except where it covers the excrescences, and there it is much reduced in thickness, being scarcely one-eighth of an inch through. The sap wood is well marked and runs into the

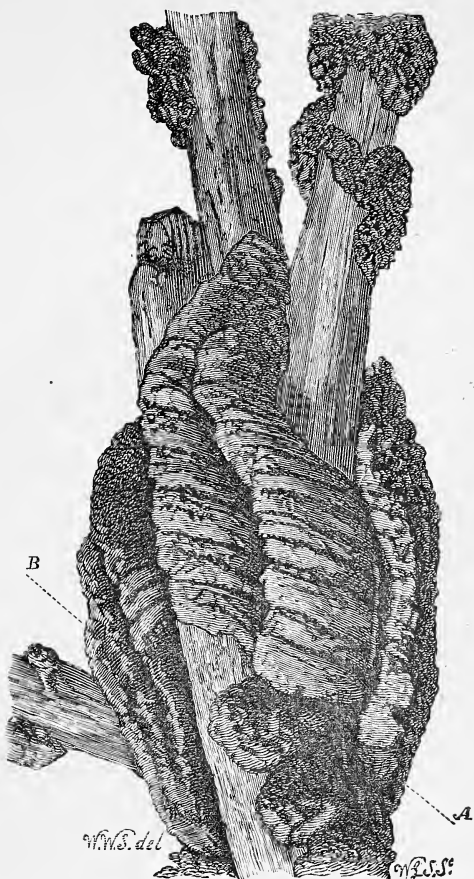
excrescences, where it is crossed by some obsolete lines radiating towards the circumference. The heart wood exhibits the centre of growth to be very eccentric, and the zones of growth very unequal and much disturbed on the side *A* by the excrescence there, and a second centre of growth which has been formed between the original centre and the circumference. The excrescence *B* is much more elevated than the one at *A*, and has the appearance of the heart wood penetrating it by two conical projections.



No. 1.—One quarter the natural size.

In drawing No. 2 the disease is well shown on the branches of the tree, and is drawn to half the natural size. It will be observed that the excrescences have now become very irregular in shape and size, in some places forming long confluent masses, which are transversely ribbed, and, although so various in size yet the excrescences are well distributed over the whole.

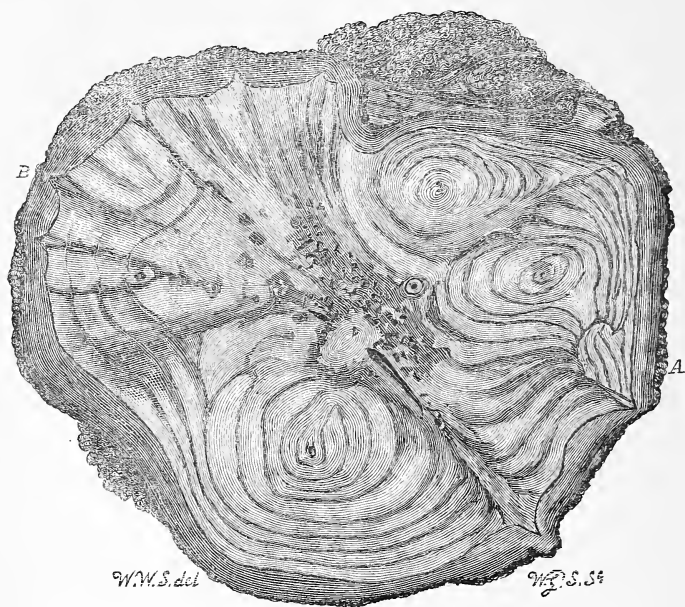
Drawing No. 3 is a section on the line *A B*, Drawing No. 2, and is the size of nature. Here a thick bark surrounds the wood, but there is no appearance of sap wood. The wood penetrates the bark in several places by conical projections, showing abortive attempts to reach the surface and forcing the bark outwards. The centre of the section shows a congregation of knotty points, around which, on the side *A*, are three different centres of growth, with corresponding zones of growth, while on the side *B* there is a mass of very irregularly grown wood, from which arise five of the conical projections I have before mentioned.



No. 2.—Half the natural size.

Drawing No. 4 gives the termination of a branch of the natural size, showing the indescribable character of these terminal excrescences and the contortions and undulations of the bark which covers them. It will be observed here that several attempts to form further growth have been made from the excrescences, one at *A* remaining, others at *B*, *C*, *D* having been broken off. It may be worth mentioning that the heart

wood, both of the stem and branches, as far as I have an opportunity of examining it, appeared firm, in good condition, and without any indications of decay. The nature of the numerous excrescences on this Acacia tree, causing all growth eventually to



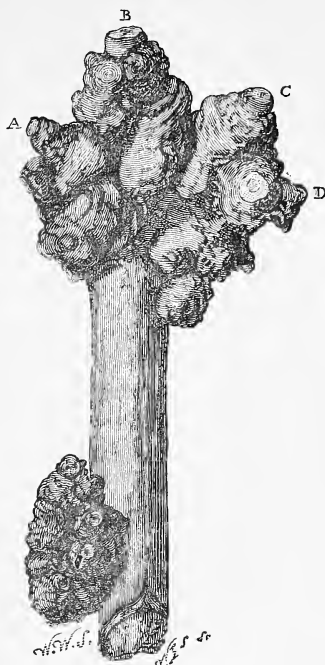
No. 3.—Natural size.

be stopped, is that of the well known knaur or burrs, commonly so called. They are thus referred to in Dr. Masters' "Vegetable Teratology," page 419, and my examinations seem entirely to confirm what is there stated.

"They are covered with bark, and consist in the interior of very hard layers of wood, disposed irregularly so as to form objects of beauty for cabinet makers' purposes. From the frequent presence of small atrophied leaf buds on their surface, it would seem as if the structures in question were shortened branches on which the woody layers have become inordinately developed as if by compensation for the curtailment in length."

Other excrescences on trees sometimes of considerable size

occur, not unfrequently caused by friction, but these I have found to be of a different character to the knaur and have no tendency to produce adventitious buds. I do not venture to give an opinion on the cause or causes which form the knaur, so little is known on the subject, and it seems very desirable to obtain more information on this interesting peculiarity of vegetable growth. I should wish it to be well understood that the drawings were made from the stem and branches of the tree long after the tree had been cut down. It would have been much more satisfactory if I could have examined it in the living state. I cannot but here thank E. Vivian, Esq., for the kind assistance he has given me as regards the diseased *Acacia* I have described.



No. 4.

XXVII.—Notes on Root-Hairs and Root Growth.

By MAXWELL T. MASTERS, M.D., F.R.S.

[Read at a Meeting of the Scientific Committee, 22nd April, 1879.]

THE hairs which are observed on the younger and finer roots seem hardly to have received the attention at the hands of cultivators that their importance demands. With a view of directing attention to them, and of inducing others with more convenience and leisure than fall to my own lot, to observe and experiment upon them, I lay before the Committee the following notes which, though of a fragmentary and incomplete character, may yet be of some service.

The appearance of these root-hairs is familiar enough to

cultivators in certain cases, though it is strange that their absence in other instances should have escaped comment, if not observation. In a Vine border for instance, it is remarkable to see how the roots will lay hold of a fragment of any nutritive substance, invest it with a dense cobweb-like network of fine fibrils from whose surface protrude the minute hairs known as "root-hairs." The substances with which the roots come into contact are often insoluble in water, a piece of bone, for example, and we must therefore admit from that, as well as from other evidence, not necessary to be detailed here, that the root-fibrils and root-hairs have the power of secreting some liquid which acts as a solvent of the mineral matters of the soil, the solution so formed being absorbed into the tissue of the plant.

Gasparrini was one of the first to draw attention to the root-hairs.* This author describes and figures many illustrations as seen under the microscope; he points out *inter alia* that the root-hairs are always unicellular; he further asserts that they sometimes exude a mucilaginous and granular matter, and he even states that in *Poa annua* the root-hairs burst or open at the extremities by means of a little flap or valve and so liberate their contents, but these statements are open to doubt.

Chatin (Mem. Soc. Nat. Sc. Cherbourg, 1856, p. 5) noted the production of these hairs when the roots come in contact with any obstacle, the contact with which he considered as sufficient to account for their formation. The thin film of moisture, however, which is apt to collect around such a body is more likely to be a determining cause than mere pressure. Mer, in alluding to this subject (Comptes Rendus, March 24, 1879), also attributes the production of root-hairs to arrest of growth caused by some obstacle. In such a case, he says, the nutritive fluids are diverted from the growing tip of the root to the adjoining tissues and especially to the epidermal cells, and hence the production of hairs. But that such explanations do not hold good in all cases, I produced evidence to show before the committee while this paper was passing through the press, in the shape of a Radish which had penetrated a piece of soft wood. This had offered sufficient obstruction to constrict and distort the root but without inducing the formation of hairs.

* Gasparrini, Ricerche sulla natura dei succiatori e la escrezione delle radice. Napoli, 1856.

It seems probable that some plants rarely if ever possess root-hairs, that in certain other cases they are formed only under certain conditions, and that they are caducous, so that they may be found at certain times and seasons, while in others they may not come under notice. So far as my own observations go, plants whose roots are wholly immersed in water are frequently, but by no means universally, destitute of conspicuous root-hairs—e.g., *Callitriche*, *Nymphæa*, *Nasturtium*. Plants with thick fleshy and woody roots still more rarely produce these outgrowths; thus, in the case of the roots descending from the corms of a Crocus, the bulbs of a Tulip or a Hyacinth, or of the fleshy root fibres of *Ranunculus Ficaria*, &c., there are no conspicuous root-hairs. I might cite other cases, such as the fleshy roots of *Sonchus arvensis*, the roots of *Taraxacum*, of *Prunella vulgaris*, and very many more, but these illustrations are sufficient for my present purpose, which is simply to show that these root-hairs are poorly developed if not entirely absent in certain categories of plants, and relatively abundant in other plants and under other circumstances. On some future occasion I hope to enter more fully into this subject, but, at present, I confine myself to these statements as preliminary to the record of some experiments made by me with a view to the investigation of the circumstances which give some plants the advantage over others when growing together, as in a pasture.

It is obvious that root development and the power of turning to account varying conditions, physical and chemical, of the soil, must be important factors in the competition and struggle for existence among plants. So far as absorption of nutritive matter is concerned it is the minutest fibrils and the root-hairs (when present) that we have to consider. We know, in a general way, that their number is much greater in the same species of plant under some circumstances than under others, that if they are growing in rich, moist, well aerated and well drained soil, the production of feeding roots is greater than under opposite circumstances. Under such favorable conditions the root fibrils are short and densely matted, whereas in sterile soil they are elongated and produce but few fibrils. The dense leash of feeding roots made by trees whose roots have access to water is familiar to all who

have wandered by a river's bank, as also the net work formed around any food-yielding substance, such as a piece of leather or of bone as above alluded to.

With reference to the varying degrees of development of the roots according to the nature of the soil they traverse, the following extract from Knight's "*Horticultural Papers*" may appropriately be cited:—

"A trench which was twenty feet long, six wide, and about two deep, was prepared in my garden, in the bottom of which trench was placed a layer, about six inches deep, of very rich mould, incorporated with much fresh vegetable matter. This was covered, eighteen inches deep, with light and poor loam, and upon the bed thus formed, seeds of the common Carrot (*Daucus Carota*) and Parsnip (*Pastinaca sativa*) were sowed. The plants grew feebly till near the end of the summer, when they assumed a very luxuriant growth, grew rapidly till late in the autumn, and till their leaves were injured by frost. The roots were then examined, and were found of an extraordinary length, and in form almost perfectly cylindrical, having scarcely emitted any lateral fibrous roots into the poor soil, whilst the rich soil beneath was filled with them.

"In another experiment of the same season, the preceding process was reversed, the rich soil being placed upon the surface and the poor beneath. The plants here grew very luxuriantly, and acquired a considerable size early in the summer; and when the roots were taken up in the autumn, they were found to have assumed very different forms. The greater part had divided into two or more unequal ramifications, very near the surface of the ground, and those which were not thus divided tapered rapidly to a point at the surface of the poor soil, into which few of their fibrous roots had entered."—KNIGHT'S "*Horticultural Papers*," XII., *On the Origin and Formation of Roots*, p. 159.

The most accurate investigations, however, as to the effect of the medium in which they are growing, on the production of root fibrils, are those of Nobbe, summarised in "*How Crops Grow*," (English Edition, p. 231). It is there shown, as a result of well devised experiments, that where the fertilising material was thoroughly mixed with the soil, the root-fibrils were evenly dispersed throughout, but where the fertiliser

was placed in layers at different depths, then the root-fibrils were most abundant in those layers, and relatively few were present in the intervening less nutritious portions. The experiments were varied in different manners, but the results, in all cases, showed that the principal development of the roots occurred in the immediate vicinity of the material which was likely to furnish them with nutriment.

On the general question of root-growth and root-absorption, however, the most important recent paper is that of Sachs in the "Landw., Versuchstat.," 1859, cap. iv., a summary of which is given in the French translation of Sachs' "Physiologie Végétale," by Micheli. It is therein shown (p. 203, figs. 16—20) that the root fibrils insinuate themselves between the minutest particles of soil, that each particle of soil is invested like the fibril itself with a thin film of water which passes by diffusion into the root. In that work the observations of Liebig, Peters, Knop, and others are summarised. Sachs also alludes to some extremely fine thread-like protrusions from the root-hairs, which it would be interesting to compare with the protoplasmic outgrowths lately observed in leaves of the Teazel, by Dr. Francis Darwin.

M. Moeller, whose researches are abstracted in the Bulletin of the Botanical Society of France (1878, t. xxv., Rev. Bibl.),* is stated to have sown seeds of *Pinus Laricio* in fifteen different soils. His general conclusions are that the length of the root is not in proportion to the total development of the plants. The length of the root depends upon the facility with which it penetrates the soil. In general, soils rich in humus produce thick roots; pure mineral ones, slender ones. Lime produces little better roots than pure sand, while lime in combination is very serviceable to root development. Some varieties of soil favour the development of the cortex, others of the woody cylinder. Heathy soil produces the greatest quantity of wood. While in the root the diameter of the woody cylinder augments in proportion with the growth of that organ, it is not so in the case of the stem, where it is the bark that predominates. It is in heathy soil that the woody portion of the plant is absolutely most developed. A limestone soil favours the wood at the expense of the bark.

* Ueber den einfluss der Bodenbeschaffenheit auf die erste Entwicklung der Schwarzföhre (*Pinus Laricio*).

Root development was also made a subject of special inquiry in the experiments undertaken under the auspices of this Committee at Chiswick, by Dr. Gilbert and myself. In those experiments, which extended over two years, twelve different plants were grown under six different conditions of manuring, and the results, including the notes on root development, were published in the Journal of this Society, 1870 (Vol. III., page 19 and page 195).

It stands to reason that a large production of root-fibrils and root-hairs exhausts the soil in their immediate neighbourhood sooner and more thoroughly than a more limited development does. But, on the other hand, it must be remembered that long, deeply rooting plants, or plants with thick root-branches penetrating downwards to a considerable depth, may, in the aggregate, produce quite as many or more feeding roots, though they may be more widely diffused and not so apparent to the eye. These differences are, in a vague general sense, denoted by the ordinary terms of "surface-rooting" or "deep-rooting" plants. The surface-rooting plants have usually finely branched root-fibres in great numbers, not penetrating very deeply and liable to be injured by drought or by frost. The more deeply rooting plants are usually plants of longer duration, with coarser, stronger, less branched but much more deeply penetrating roots. Such plants therefore are better able to withstand drought, first because they are not so much affected by surface evaporation, and next because they can obtain supplies of moisture from a greater depth.

It is, however, not my purpose to allude in further detail to these subjects here, but, in reference to the changes in roots produced by different circumstances, I may, in passing, allude to a remarkable change which I have more than once observed when growing seeds of oak, filbert, and chesnut in bottles of water. In such cases, especially when, owing to the non-removal of the cork, the air in the bottle becomes somewhat stagnant, I have observed the production of very numerous flat, flaky excrescences, spongy in texture, and whitish in colour, from the sides of the root and of the stem. Under the microscope these excrescences are seen to consist of large oblong cells, loosely aggregated, and confined within a thin epidermal layer. These outgrowths suggest a resem-

blance to the warty outgrowths met with on the leaves of vines, and which I have lately seen on the foliage of forced potatoes, and they call to mind the spongy investment of the aërial roots of Orchids and Arads, and the similar but firmer growths which invest the roots of Cycads when they are thrust up above ground. These points seem all significant, but, for want of fuller information, I pass them by with the mere mention, and proceed to narrate the details of some experiments made with a view of obtaining information as to the production of root-hairs.

The experiments were carried out in the following manner :—
Seeds of Mustard (*Sinapis alba*), and of Cress (*Lepidium sativum*) were sown on the same day in 6-in. (top diameter) flower pots, filled with soils of various characters, thus :—

- (1.) Two pots were filled with stiff yellow clay, rammed in hard.
- (2.) Two with washed gravel pebbles, varying in size from that of a pea to that of a hazel nut.
- (3.) Two with lumps of “ballast” or burnt clay, varying in size from the dimensions of a filbert to those of a walnut.
- (4.) Two with rich garden mould.
- (5.) Two with layers of flannel.
- (6.) Two with compact layers of half-rotten leaves.
- (7.) Two with road scrapings.

These substances were chosen as affording varying degrees of permeability; thus, Nos. 1 and 6 were likely to be penetrated with difficulty by the radicles; Nos. 2, 3, and 7 might be expected to be readily, and Nos. 4 and 5 moderately, traversed by the roots. The capacities for holding water, admitting air, and of furnishing nourishment may also be presumed to have varied in each case.

The seeds were chosen by reason of their ready and speedy germinating power, and because while the Mustard produces a large quantity of root-hairs, the Cress produces, under the same circumstances, so few, that a lens is usually requisite to see them at all.

The seeds were sown on the 22nd of January, 1878, one half of each pot being occupied with Mustard, the other half

with Cress. The seeds were laid on the surface of the soil and just covered with a thin layer of the same soil, or in the case of the rammed clay, the pebbles, and the burnt clay with a thin covering of damp sand, which, as subsequent experience showed, would have been better omitted. The pots were placed in an open frame in the garden.

On the same day seeds of Mustard and of Cress were sown on plates of charcoal (8), and on slabs of glass (9), the seeds being covered in the latter case with cotton-wool kept moist. The three last-mentioned sets of seeds were placed in a cupboard in a room warmed in the daytime by a fire.

On the 3rd of February, the seeds on the charcoal and on the glass were examined, with the following results:—
(8) Charcoal. Mustard seedlings, February 3rd, average height of seedlings 10 centimetres, of tigellum 7—8, of radicle 2—3 centimetres (a few root-hairs). Cress seedlings, average height 7—8 centimetres, of tigellum 5, of radicle 2—3 centimetres.
(9) Glass. Mustard, average height 4—5 centimetres, of tigellum 2—3, of radicle $1\frac{1}{2}$ —2 centimetres. (Root-hairs extremely abundant and very fine, forming a dense cobweb-like leash or net work.) Cress, average height 3—4 centimetres, of tigellum $1\frac{1}{2}$ —2, of radicle 2— $2\frac{1}{2}$ centimetres. (Root-hairs of the same general character as in the case of the Mustard but less dense.)

The seedlings in one set of pots were examined on February 16th, and the following appearances noted; the measurements being taken from the seedlings near the centre of each pot and in such a way as to give a fair average of the entire height, of the height of the tigellum and of that of the radicle. The measurements must, however, be looked on as approximative only:—

(1.) RAMMED CLAY. Mustard, average height 8—9, length of tigellum 3—4, of radicle 4—5 centimetres. Cress, average height 3, length of tigellum 1, of radicle 2 centimetres.

In neither case were there many root-hairs, all the time the radicles remained in contact with the soil. Despite the thickness and tenacity of the clay, the radicles penetrated it to reach the sides of the pot; having done so, they produced an abundance of root-hairs.

In the subsequent paragraphs, in order to save repetition, the words tigellum and radicle are omitted; but it will be under-

stood that the first brace of figures refers to the total average height, the second to the length of the tigellum, the third to that of the radicle.

(2.) PEBBLES.—Mustard, 7—8, $2\frac{1}{2}$, 5—6 centimetres. Cress, 4—6, $1\frac{1}{2}$, 4 centimetres.

The Mustard produced numerous root-hairs when the radicles penetrated the smaller interstices between the stones. The Cress under the same circumstances produced very few.

(3.) BALLAST.—Mustard, 9—10, 2—3, and 6—7 centimetres. Cress, 5—6, $1\frac{1}{2}$ —2, and $2\frac{1}{2}$ — $3\frac{1}{2}$ centimetres.

In the Mustard dense root-hairs were observed where the roots came into contact with the sand by which the lumps of ballast were covered; in the Cress they were much less abundant.

(4.) GARDEN SOIL.—Mustard, 10—12, 3—4, and 7—9 centimetres. Cress, 5—6, $1\frac{1}{2}$ —2, and 4— $4\frac{1}{2}$ centimetres.

In this instance the roots descended vertically into the soil. In the case of the Mustard there was a production of a dense mass of root-hairs to which the soil adhered, while in the case of the Cress the hairs were very much less numerous.

(5.) FLANNEL.—Mustard, 6—7, $2\frac{1}{2}$, and 4—5 centimetres. Cress, 3, 1, and 2 centimetres.

The flannel was covered with a thin layer of sand, in passing through which the radicles of the Mustard developed a few root-hairs, while none, or only a few and those very small, were formed while the roots were traversing the flannel. Very few hairs were produced on the roots of the Cress.

(6.) DECAYED LEAVES.—Mustard, 9—10, 4, and 5 centimetres. Cress, 5, 2—3, and 3 centimetres.

In the case of the Mustard the radicles were very densely clothed with root-hairs all the way up from near the apex. The Cress had comparatively few hairs.

(7.) ROAD SAND.—Mustard, 9—10, $2\frac{1}{2}$ —3, and 6—7 centimetres. Cress 6, 2, and 4 centimetres.

Upper end of radicle of Mustard covered with a dense mass of hairs to which the soil was adherent; tip nude. The Cress presented like appearances but less in degree.

On the 3rd of March the second set of seedlings were examined and the following notes taken:—

(1.) RAMMED CLAY.

In both plants the heights were too unequal to allow of a fair average being arrived at. The radicles that penetrated the clay and reached the sides of the pot were very luxuriant and produced an abundance of root-hairs. Those that were in the middle of the clay, and which were, by reason of their position, debarred from reaching the sides of the pot so speedily, were stunted in growth and had but few hairs.

(2.) PEBBLES.—Mustard, average height 15—16, length of tigellum 4—6, length of radicle 8—10 centimetres. Cress, 8—9, 2, 6—7 centimetres.

In this case some of the sand that had been scattered over the surface was washed down between the pebbles. The root fibrils of the Mustard were directed obliquely downwards, and had but few root-hairs. The Cress also had few hairs.

(3.) BALLAST. — Mustard, 15, 5—6, 10—12 centimetres. Cress, 7—9, 3—4, 5—6 centimetres.

The radicles of the Mustard were straight, unbranched and with few root-hairs; those of the Cress were directed more obliquely, were somewhat more branched, and had very few hairs except where they came into contact with the sides of the pot.

(4.) GARDEN SOIL.—Mustard, 12—13, 6, 6—7 centimetres. Cress, 13—14, 4, 9—10 centimetres.

The radicles of the Mustard were slightly branched, the fibrils spreading horizontally, but with few root-hairs. The radicles of the Cress were perfectly straight and unbranched, with few root-hairs except near the sides of the pot.

(5.) FLANNEL.—Mustard, 4—5, 3—4, 1—2 centimetres. Cress, 3—4, 2—3, 1—2 centimetres.

In the centre of the pot where the flannel had become dry, the radicles shrivelled and died from below upwards. Near the sides of the pots, however, the vigour of the seedlings was greater and the number of root-hairs larger.

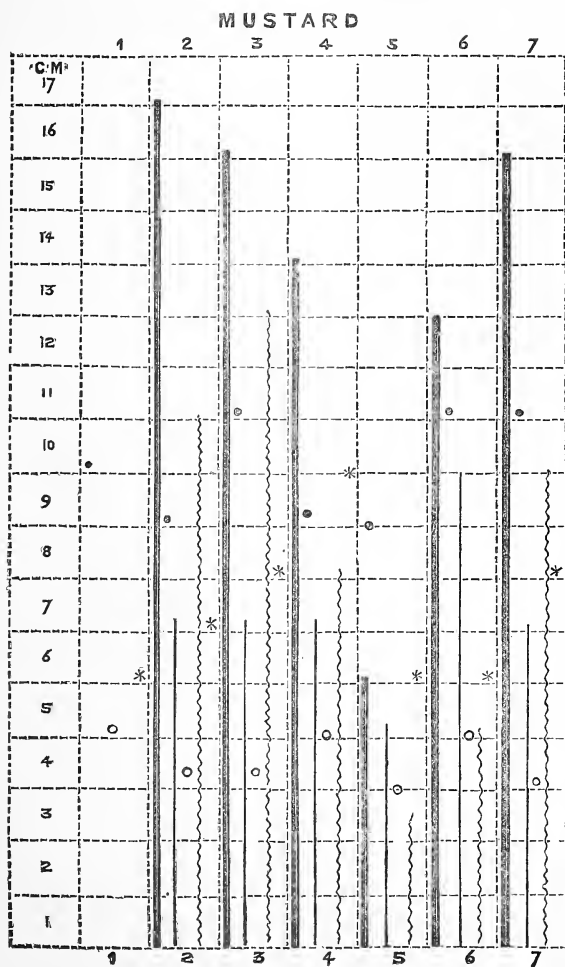
(6.) DECAYED LEAVES.—Mustard, 12, 8—9, 3—4 centimetres. Cress, 8, 4—5, 3—4 centimetres.

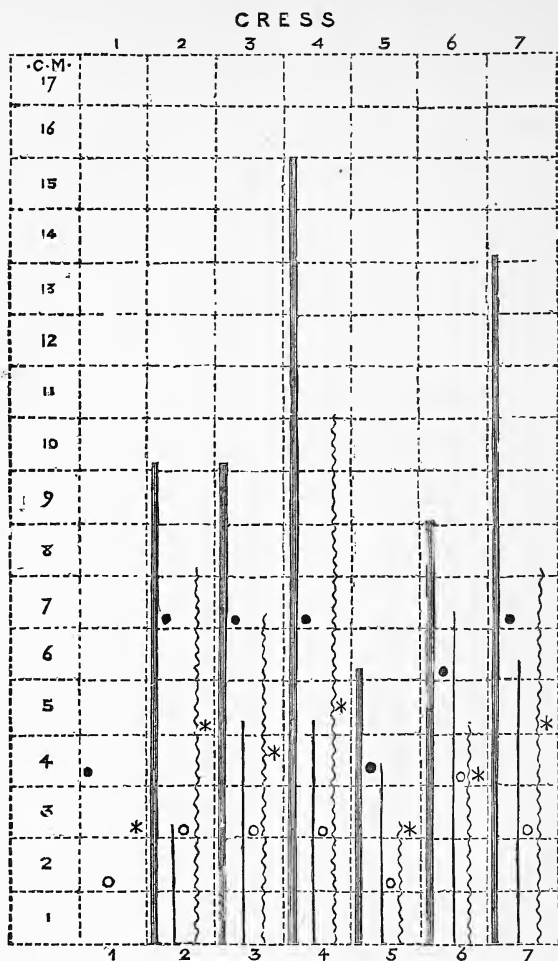
In this pot the great proportionate length of the tigella or caulicles was remarkable. The downward growth of the radicle was impeded by the layers of tough leaves. At the sides of the pots the radicles and root-hairs were most abundant, and on the surface of the leaves themselves the hairs were relatively very numerous.

(7.) ROAD SAND.—Mustard, 14—15, 5—6, and 8—9 centimetres. Cress, 12—13, 4—5, and 7—8 centimetres.

The radicles of the Mustard were quite straight, with a few horizontal branches. The root-hairs were cobwebby, and very abundant; less so in the case of the Cress.

The subjoined diagrams will show in brief and approximately some of the chief results of the experiments in the case of the Mustard and of the Cress respectively.





Each horizontal space is supposed to correspond to a centimetre. The vertical spaces 1—7 correspond to the respective pots. The dots, circles, and asterisks represent the condition of the seedlings on February 16th; the lines, that in the duplicate set examined on March 3rd. The average total height of the seedlings (Mustard or Cress) is shown by black dots or thick lines respectively, the average height of the tigellum is shown by circles \circ or by thin lines, the average length of the radicle by asterisks * or by wavy lines.

On the whole, the results of the four sets of observations (two for the Mustard, two for the Cress) are quite as uniform, if not more so, than is ordinarily the case in similar experiments.

In the case of No. 1, the relatively impenetrable character of the clay is well shown in the table; the strongest seedlings did indeed manage to thrust their radicles through it, and to reach the sides of the pot, and then, and not till then, did they produce any root-hairs; so that the mere presence of a solid obstacle is not of itself sufficient, as stated by Chatin, to account for the presence of the hairs.

The general result was so irregular that, on the second examination, it was found impracticable to get any fair average; some of the seedlings were dead, many were weakly, a very few had managed to penetrate the clay to any distance. The relative barrenness of stiff clays in this way receives some illustration.

In the case of Nos. 2 and 3 (pebbles and ballast), the conditions were nearly the same; water and air could be admitted freely, and the roots could easily penetrate the interstices of the stones, and avail themselves of the thin films of water adhering to the stones. The result is shown in the high average vigour of the seedlings, and in the length of the radicles. It was noticeable also that root-hairs were plentifully produced under the lea of the stones.

In 4 (garden soil) a high average degree of vigour was observed in both the Mustard and the Cress; but in the former the relative proportions of tigellum and radicle were more uniform than in the case of the Cress. The roots of the Cress were more highly developed as to size in this pot than in any other of the Cress series. In the case of the Mustard, it will be observed that the roots in No. 4 appear in the diagram to have been longer in February than they were in the corresponding pot examined a fortnight later; but this appearance is false, and arises from the fact that the dot is accidentally placed too low in the column and the asterisk too high.

In number 5 (flannel) we have a similar discrepancy, the total length of the Mustard seedlings and of their radicles being noted as greater in the first batch than in the second. No such discrepancy is observable in the case of the Cress grown in the same pot. The seedlings of the Mustard were very much

stunted and withered, so that it is to be presumed that they did not get their fair share of moisture, which by some accident was concentrated on that half containing the Cress.

In number 6 (rotten leaves), the conditions were very favourable except in the matter of penetration, the tough leaves offering a considerable obstacle. Still, the moisture and the decaying vegetable matter furnished a relative abundance of food, as is seen by the high average vigour. The length of root was relatively small, but the proportion of root-hairs was large.

In No. 7 (road scrapings) the conditions were also favourable, the soil was readily permeable to water and air, readily laid hold of by the roots, and no doubt contained available plant food. The general result was an even growth, and a high average development of all parts of the seedling plant.

With reference to the production of root-hairs, some further remarks may be made arising out of these experiments. The length of the radicle offers no guide to the number of root-hairs. If the food is within a short distance there is no need for the roots to travel far, and they throw out their feeders where the food is to be obtained. Wherever the soil is light and porous, there the root-hairs may be expected to be most abundant, and wherever there is a thin film of water investing a stone, or the side of a porous flower pot, or a plate of glass, there the root hairs abound. Where the opposite conditions prevail, there the production of root-hairs is relatively small.

The variations in the total length of the seedlings and of the radicle are easily explained by the circumstances of growth. On the other hand, the comparative uniformity in the height of the tigellum may perhaps be explained by the fact that the office of this part of the plant is simply to uplift the seed leaves above the surface, and this done, there is no further need for it to elongate. Root-hairs are never, I believe, produced from it. The great length of the tigellum in pot No. 6 (rotten leaves), both absolutely and relatively, is noteworthy. It occurred in the Mustard seedlings as well as in the Cress, but I am not able to suggest an explanation of the phenomenon.

XXVI.—REPORT on Gloxinias, Grown at Chiswick for Trial by
Floral Committee. 1878. By A. F. BARRON.

THE enormous increase in the number of varieties and the wondrous development of beauty and novelty amongst Gloxinias during the past few years suggested the desirability of forming a collection of them in the Gardens, and nothing could have proved much more attractive or interesting. The varieties here described were chiefly received from Messrs. Veitch and Sons, and the celebrated collection of M. Duval, of Versailles; Lemoine, of Nancy, and Chantrier Frères.

The Gloxinias, originally of one class only, having the flowers drooping; now, owing to hybridization, are of two very distinct classes, viz. :—

1. *Flowers erect*. By far the most attractive and numerous.
2. *Flowers drooping*.

*** denote First-class Certificates.

ERECT FLOWERING VARIETIES.

1. *Ami Thibaut* (Veitch and Sons). Flowers medium, white, covered with rather large reddish spots, the throat shaded with magenta. A very pretty and distinct variety.
2. *Alsace* (Veitch and Sons). Flowers of medium size; very bright rose, shaded with crimson. Very pretty colour.
3. *Aïda* (Duval). Flowers of medium size; pale rose, the throat shaded and speckled with crimson.
4. *Aline* (Lemoine). Flowers large, of good form; dark blue, the throat regularly streaked with pale blue, the lobes speckled and margined with very pale purple. Very telling.
5. *Boule de Feu**** (Duval). Flowers large, of very fine form; very deep scarlet, the lobes margined with pale rose; strong vigorous growth, the foliage dark green. Splendid. First-class Certificate.
6. *Boule de Neige* (Veitch and Sons). Flowers medium size; pure white, close compact growth, free flowering and good.
7. *Brilliant* (Veitch and Sons). The flowers somewhat small; bright crimson, the throat shaded with magenta.
8. *Buisson ardent* (Chantrier). Flowers very erect, small; bright crimson, the lobes margined with rose; dwarf habit.

9. *Belle Jeannette* (Duval). Flowers large and of good form; white, the throat and lobes speckled and shaded with pale blue; very free flowering.
10. *Coupe d'Hébé* (Veitch and Sons). Flowers semi-erect, large, and of good form; rosy crimson, the throat white, speckled with clear magenta, the lobes margined with white. Distinct and good.
11. *Cardinal de Richelieu* (Lemoine). Flowers of medium size; white, irregularly speckled with violet. Inferior.
12. *Charme de Lutèce* (Lemoine). Flowers of medium size, of very fine form; white, regularly speckled with bluish lilac. Very fine dwarf habit, and free flowering. A beautifully marked and pleasing variety.
13. *Comtesse de Barral* (Veitch and Sons). Flowers pink, the throat very closely streaked and speckled with pale pink, the lobes margined with white. A distinct pale coloured variety.
14. *Coquette d'Asnières* (Veitch and Sons). Flowers small; pale purplish lilac, with speckled throat. Inferior.
15. *Duchess of Teck* (Veitch and Sons). Flowers large, of fine form; dark purplish scarlet, the lobes margined and shaded with beautiful magenta. Very handsome.
16. *Domenico Scassi* (Lemoine). Flowers small, roundish; pale blue or mauve, the throat pure white. A very delicate coloured and charming variety. Distinct.
17. *Dernière Mode* (Veitch and Sons). Very similar to *Charme de Lutèce*.
18. *Dr. Demarquay* (Veitch and Sons). Flowers large, of fine form; rosy crimson, the throat pure white, with streaks of purplish crimson, the lobes having a very distinct pure white margin. Good.
19. *Fanfaron* (Veitch and Sons). Flowers large, roundish; white, faintly speckled, the lobes violet purple, with clear blue margin. Free vigorous habit. Distinct and good.
20. *Flamboyant* (Veitch and Sons). Flowers very large; rosy crimson, the throat streaked and speckled with rose. Strong vigorous growth.
21. *Fusilier* (Kinghorn). Flowers small; pale crimson, with purplish throat. Inferior.

22. *Gambetta* (Veitch and Sons). Flowers very large, of fine form ; clear rosy crimson, the throat pure white, the lobes margined and shaded with crimson. Very strong vigorous growth. A showy variety.
23. *Henry Flèche* (Duval). Flowers very large, of good form ; very bright rose, the throat crimson shaded with magenta, the lobes distinctly margined with white. New and good.
24. *Henry Minger* (Lemoine). Like *Domenico Scassi*.
25. *Irene* (Kingham). Flowers small ; rosy crimson, the throat white, spotted with pale purple. Inferior.
26. *Jules Pirlot* (Veitch and Sons). Flowers of medium size ; white, the throat very regularly streaked and speckled with pale rose, the lobes distinctly shaded with dark magenta.
27. *John Gray* (Chantrier). Flowers very large, roundish ; beautiful dark purple, the throat shaded with violet, the lobes margined with dark blue. Strong vigorous growth. The darkest-flowered variety. Very distinct and beautiful.
28. *Lina Boutard* (Chantrier). Flowers small, covered with very minute violet-coloured speckles. Inferior.
29. *Lord Derby* (Veitch and Sons). Flowers very large and of fine form ; purple, the throat pure white, the lobes purple, shaded with violet and margined with pale blue. Very showy and striking.
30. *La Rosière* (Veitch and Sons). Flowers large and flimsy ; crimson, throat pure white, slightly shaded with crimson. Inferior.
31. *Madame Furtado* (Veitch and Sons). Flowers small ; bright crimson, with pure white margin. Inferior.
32. *Madame Boutard* (Lemoine). Very similar to *Jules Pirlot*.
33. *Madame de Stäel* (Lemoine). Flowers of medium size, semi-erect ; pale rose, shaded with delicate lilac, the throat covered with very small dark lilac spots. Good.
34. *Madame Courant* (Veitch and Sons). Like *Aline*.
35. *Madame Schaye* (Chantrier). Flowers large and of good form ; purplish crimson, the throat slightly speckled with rose, the lobes margined with pale rose.
36. *Madame A. Truffaut* (Duval). Flowers large, roundish ; rosy white, the throat pure white, the lobes having a very distinct broad margin of bright rose. Very distinct and good.
37. *Mont Blanc* *** (Duval). Flowers very large, of very

fine form; beautiful pure white; strong robust growth. The best white variety.

38. *Marguerite d'Elkingen* (Veitch and Sons). Flowers large; deep bluish purple, the throat white, covered with small speckles extending into each lobe and forming a star. Very distinct and showy.
39. *Mon Caprice* (Veitch and Sons). Flowers of medium size; rosy magenta, shaded with crimson; the throat very conspicuous, pure white, the lobes regularly speckled with small crimson spots. Very free growth. A pleasing variety.
40. *MacMahon* (Veitch and Sons). Flowers large, of good form, very freely produced; of a beautiful magenta shade, the throat pure white, the lobes having a creamy white margin. Strong vigorous growth. Very good.
41. *M. A. Truffaut* (Duval). Flowers very large, of fine form; very rich dark crimson, the lobes beautifully shaded with magenta. A showy variety.
42. *M. Pigmy* (Duval). Flowers large and of fine form; beautiful dark crimson, the throat shaded with magenta, the lobes distinctly margined with rosy crimson. Strong vigorous growth. Showy and good.
43. *Orbulaire* (Veitch and Sons). Flowers pale rose, the lobes margined with white. Inferior.
44. *Olhos d'Agua* (Lemoine). Flowers of medium size, bright rose, the throat and lobes shaded with magenta. Fine vigorous habit. Very showy.
45. *Oswald de Kerchove* (Lemoine). Flowers of medium size, violet purple, the throat regularly speckled with blue, the lobes having a very distinct rich blue margin. Good.
46. *Papillon* (Lemoine). Flowers small; blue, streaked and margined with a darker shade of blue.
47. *President Grévy* (Lemoine). Flowers large; very freely produced, pale blue, shaded with violet when expanding, the throat pure white. Very distinct and pretty.
48. *Paracatu* (Lemoine). Flowers of medium size, pale rose, the throat and part of lobes shaded with magenta, and covered with very minute specks of a darker hue.
49. *Richard Thornton* (Veitch and Sons). Flowers small, irregularly formed; white, shaded with pale blue and covered with small violet specks. Inferior.

50. *Robè Etoilée* (Chantrier). Very similar to *Charme de Lutèce*.
51. *Roi des France* (Lemoine). Flowers of medium size; very bright crimson, the throat speckled with bright magenta, the lobes having a very evenly defined margin of pure white. Very fine dwarf growth. A distinct and beautiful variety.
52. *Richard Wallace* (Veitch and Sons). Very similar to *Olhos d'Agua*.
53. *Sir Stafford Northcote* (Veitch and Sons). Flowers very large, freely produced; deep crimson scarlet, the lobes of fine form, having a very broad rose coloured margin. Strong vigorous habit, large deep green leaves. Very fine.
54. *Suavis* (Veitch and Sons). Of a lighter shade, but very similar in every other respect to *Madame de Stäel*.
55. *Sunshine* (Veitch and Sons). Flowers small, very much reflexed; pale rose, with greenish white throat. Very inferior.
56. *San Joas del Rey* (Lemoine). Flowers small, very freely produced; rose coloured, deeply shaded with magenta, the throat very closely streaked with dark magenta extending into the lobes.
57. *Skeltonii* (Veitch and Sons). Flowers very small; pale rose, with white margin. A very inferior variety.
58. *Theophile Gautier* (Lemoine). Flowers white, faintly speckled with pink. Worthless.
59. *Triomphe* (Lemoine). Flowers large and of fine form; rosy crimson, the throat pure white, with distinct purplish crimson band and pure white margin. Fine vigorous habit. A fine, showy variety.

DROOPING FLOWERED VARIETIES.

60. *Alice* (Veitch and Sons). Flowers large and of good form; dark blue, the throat creamy white, lower half of lobes shaded with violet. Fine dwarf habit. Good.
61. *B. S. Williams* (Lemoine). Flowers of medium size; bright rosy crimson, the throat crimson, distinctly shaded with magenta, the lobes margined with rose. Very showy.
62. *Charles Dickens* (Veitch and Sons). Flowers of medium size; dark blue, with a pure white blotch in the throat. Of very dwarf, compact growth.
63. *Etna* (Lemoine). Flowers very freely produced, large, of

very fine form; beautiful rich crimson, the throat clear purplish crimson, the lobes having a distinct broad margin of rose. Fine vigorous habit. A beautiful variety.

64. *Gamos* (Veitch and Sons). Flowers large; pale rose, with distinct crimson blotch in the throat.
65. *Georges Sand* (Lemoine). Flowers of medium size; very pale rose, with distinct white blotch in the throat, the lower part of throat slightly shaded with crimson.
66. *Gloria Mundi* (Lemoine). Flowers large and of fine form; very bright rose, with creamy white blotch in the throat, the lower part of the lobes bright crimson. Very fine.
67. *Madame Patti* (Veitch and Sons). Flowers of medium size, pale rose, the throat and lower part of lobes shaded with crimson. A somewhat coarse growing variety.
68. *Marquis of Lorne* (Veitch and Sons). Flowers large, sparsely produced; very pale rose, the lobes distinctly blotched with pure white. Free-growing.
69. *Miss Hannah de Rothschild* (Veitch and Sons). Flowers large, on very short footstalks; white, faintly tinged with mauve, with a distinct chocolate coloured blotch in the throat. Very free vigorous growth.
70. *Mr. Haines* (Veitch and Sons). Flowers large and of fine form; very dark red, the throat rich crimson, the lobes bright crimson, margined with pale rose. Showy and good.
71. *Mammouth* (Lemoine). Flowers of medium size; the throat and upper part of lobes dark brownish purple, the lower lobes shaded with crimson.
72. *Prince Arthur* (Veitch and Sons; Kinghorn). Flowers very large, of good form; very dark blue, the throat dark purple shaded with violet, the lobes margined with purple. Very strong vigorous habit; leaves large, very dark green. A splendid variety.
73. *Prince Leopold* (Kinghorn). Flowers small and flimsy; bright rose, with white blotch in throat. Inferior.
74. *Rev. A. H. Bridges* (Veitch and Sons). Flowers medium sized; pale rose, the throat and lobes very regularly streaked and speckled with bright rose. Loose habit.
75. *Tricolôre* (Lemoine). Flowers of medium size; rose, shaded with magenta, the lobes having a very conspicuous white band along the centre. Very close dwarf habit. Good.

76. *Washington* (Chantrier). Flowers of medium size ; dark red or crimson, the throat and lobes distinctly shaded with magenta. Dwarf habit.

Classification as to Colour of Flowers.

ERECT FLOWERING VARIETIES.

FLOWERS PURE WHITE.

- | | | |
|--------------------------|--|------------------------|
| * <i>Boule de Neige.</i> | | *** <i>Mont Blanc.</i> |
|--------------------------|--|------------------------|

FLOWERS PUNCTATED OR SPOTTED.

- | | | |
|----------------------------|--|-------------------------|
| <i>Belle Jeannette.</i> | | * <i>Dernière Mède.</i> |
| * <i>Charme de Lutèce.</i> | \| | <i>Robe Etoilée.</i> |

FLOWERS SPECKLED AND STREAKED.

- | | | |
|-------------------------------|--|----------------------------|
| <i>Ami Thibaut.</i> | | * <i>Madame Thibaut.</i> |
| <i>Cardinal de Richelieu.</i> | \| | <i>Madame Boutard.</i> |
| <i>Comtesse de Barral.</i> | | * <i>Madam de Stäel.</i> |
| <i>Coquette de Asnières.</i> | \| | <i>Paracatu.</i> |
| * <i>Jules Pirlot.</i> | \| | <i>Suavis.</i> |
| <i>Lina Boutard.</i> | | * <i>San Joas del Rey.</i> |

Theophile Gautier.

FLOWERS CRIMSON AND ROSE, WITH WHITE THROAT.

- | | | |
|------------------------|--|----------------------------|
| * <i>Coupe d'Hébé.</i> | | * <i>MacMahon.</i> |
| <i>Dr. Demarquay.</i> | | * <i>Mon Caprice.</i> |
| <i>Flamboyant.</i> | | * <i>Madame Schaye.</i> |
| * <i>Gambetta.</i> | \| | <i>Madame A. Truffaut.</i> |
| * <i>Henry Flèche.</i> | \| | <i>Orbiculaire.</i> |
| <i>Irene.</i> | \| | <i>Roi des France.</i> |
| <i>La Rosière.</i> | \| | <i>Skeltonii.</i> |
| <i>Madame Furtado.</i> | \| | <i>Sunshine.</i> |

* *Triomphe.*

FLOWERS ROSE AND ROSY CRIMSON.

- | | | |
|------------------------|--|-------------------------|
| * <i>Alsace.</i> | \| | <i>Fusilier.</i> |
| <i>Aïda.</i> | | * <i>Olhos d'Agua.</i> |
| <i>Buisson Ardent.</i> | \| | <i>Richard Wallace.</i> |

FLOWERS DARK CRIMSON AND SCARLET.

- | | | |
|---------------------------|--|----------------------------------|
| *** <i>Boule de Feu.</i> | | * <i>M. Pigmy.</i> |
| <i>Brilliant.</i> | \| | <i>M. A. Truffaut.</i> |
| * <i>Duchess of Teck.</i> | | * <i>Sir Stafford Northcote.</i> |

FLOWERS BLUE AND PURPLE, WITH WHITE THROAT.

- | | | |
|---------------------------|--|---------------------------------|
| <i>Aline.</i> | \| | <i>Madam Courant.</i> |
| * <i>Domenico Scassi.</i> | | * <i>Marguerite d'Elkingen.</i> |
| <i>Fanfaron.</i> | \| | <i>Oswald de Kerchove.</i> |
| <i>Henry Minger.</i> | | * <i>President Grévy.</i> |
| * <i>Lord Derby.</i> | \| | <i>Papillon.</i> |

FLOWERS DARK PURPLE.

* *John Gray.*

DROOPING FLOWERED VARIETIES.

FLOWERS ROSE AND ROSY CRIMSON.

* <i>B. S. Williams.</i>	|	<i>Madame Patti.</i>
<i>Gamos.</i>	|	<i>Prince Leopold.</i>
* <i>Gloria Mundi.</i>	|	<i>Rev. A. H. Bridges.</i>
<i>Georges Sand.</i>		* <i>Tricolore.</i>

FLOWERS DARK RED AND CRIMSON.

* <i>Etna.</i>		* <i>Mr. Haines.</i>
	|	<i>Washington.</i>

FLOWERS BLUE AND PURPLE.

* <i>Alice.</i>		* <i>Miss Hannah de Rothschild.</i>
<i>Charles Dickens.</i>	|	<i>Mammouth.</i>
<i>Marquis of Lorne.</i>		* <i>Prince Arthur.</i>

N.B.—Three asterisks denote First-class Certificates ; one asterisk denotes a selection of the best varieties in their respective classes.

XXIX.—Notes on the Genus Tulipa.

By H. J. ELWES.

THOUGH the Tulips are among the earliest flowers that have attracted the notice of gardeners, and though the mass of literature concerning them is so large that it would be almost impossible to go through it, yet our knowledge of many species in a wild state is still very imperfect. I much doubt whether it would be possible to trace many of our garden varieties to their origin ; and even if I was able to do so, it would be of little advantage, as the number of garden varieties is so large, and many of them are so very similar to each other, that they are better treated as florist flowers ; and as such they will no doubt always maintain a leading position among garden plants.

As, however, during the last few years two of our most eminent botanists, Dr. Regel, Director of the Imperial Botanic Gardens at St. Petersburg,* and Mr. Baker, of the Royal Herbarium, Kew,† have revised and described the genus, I will endeavour to supplement these revisions by some notes on the species which have come under my observation in a living state, as well as those which are not yet introduced to cultivation.

* *Descriptiones Plantarum, etc. Fasciculus I., pp. 37—57. St. Petersburg, July, 1873. E. Regel.*

† *Revision of the Genera and Species of Tulipæ. J. G. Baker. Journal of Linnean Society Bot., Vol. XIV., 1874, pp. 275—96.*

The genus includes, according to Mr. Baker's revision, about fifty, and according to Dr. Regel's, about thirty species, to which he has since added ten or twelve more, and extends from Great Britain, through Central and Southern Europe, Asia Minor and Central Asia, to Japan, though the majority of the species are natives of Southern Europe, Asia Minor, and Turkestan.

I have endeavoured, without success, to find some natural and at the same time simple manner in which to divide the genus into sections, as I have been unable to follow out the sections formed by Mr. Baker and Dr. Regel, which are founded on the character of the bulb tunics, and on the pubescence of the peduncle and filaments.

None of these characters seem to me sufficiently well marked or uniform to be trusted implicitly in naming plants in this genus, and it would be even more unsafe to rely on characters drawn from the leaves, colour, or shape of the perianth, or from the stigma or anthers.

The genus is without doubt an extremely natural and homogeneous one, and, with the exception of three little-known species from Asia and Japan which I have not seen, and which are included under the subgenus *Orithya* (Don) by Mr. Baker, it contains no plants which could not be recognized at a glance as Tulips by the most casual observer. Under these circumstances it seems to me better to leave it in its natural undivided state, than to try by artificial means to cut it up into sections.

The numerous Tulips recently discovered in Central Asia by Col. Korolkow, M. A. Regel, and other Russian Botanists, are fully described in the first part of a work recently published by Dr. Regel on the Flora of Turkestan, containing the Primulaceæ and Liliaceæ. As, however, this work is in Russian, it is practically useless to all but a very few botanists. From what I have seen of the Turkestan Tulips in a living state, and from the descriptions and figures published in the "Garten Flora," and in the "Descriptiones Plantarum Novarum," I am inclined to think that some of them will prove when better known to be local forms or varieties of species found in other parts of Asia.

The same observations will apply to the various Levantine Tulips described by Boissier and others; but it seems to me very difficult, if not impossible, to understand the characters and

affinities of these numerous forms, without having seen and compared the plants in a living state.

The influence of soil and climate upon them is very great, so much so that it is almost impossible to recognize the wild plants after a few years of cultivation, and in the arid soil and hot climate of Asia Minor and Turkestan, Tulips assume characters which are soon lost under more favourable conditions of life.

This question bears very forcibly on the origin of species, and proves to my mind that the herbarum work of the botanist, at any rate in connection with Liliaceous, Amaryllidaceous, and Iridaceous plants, the only ones which I have minutely studied, must be tested and supplemented by the work of the garden before anything like an accurate knowledge can be obtained.

I have in most cases refrained from describing the bulbs of the species I have seen, because, with few exceptions, I am unable to recognize them with certainty, and though they are often of some value in deciding the affinity of a plant, yet I do not think they can be relied on with the same certainty as in the genus *Crocus* or *Lilium*.

I have marked with a (*) those species which I have seen in a living state, most of which have been cultivated for two or three years in my garden.

I have found that all, or nearly all, are hardy in respect of their endurance of cold, but many of them will not long endure our wet winters and cold springs without protection. It is therefore better to plant them in a dry situation under the shelter of a frame, which, while exposing them to the full sun, will throw off the rain during their resting season from June or July to November.

Many of the European and some of the Asiatic species succeed perfectly in the open border, but it is best to lift and replant the bulbs every year or two. The only mode by which many of the species can be propagated is by seed, as offsets are produced very sparingly, and it seems in some cases hardly ever; the seed if sown when ripe germinates in spring, and produces full sized bulbs in six or seven years.

* *Tulipa oculis solis*, St. Amand, Red. Lil., t. 219; Sweet's "Brit. Flow. Gard.," ser. 11, t. 102. This fine Tulip is the type of a group characterised by the woolly down with which their bulb coats are lined. So nearly allied to it, that I see no

good characters by which to separate them, are *T. præcox*, of Tenore, "Bot. Reg.," t. 204, 380, 1143; *T. Raddii* and *T. maleolens*, Reboul, "Bot. Reg.," 1839, t. 66; and some Eastern forms which are distinguished by Mr. Baker as var. *Lycica* and var. *Aleppica*.

The form most commonly known in cultivation is *T. præcox*, and I am not aware whether living specimens of the true *Oculus solis*, supposing that it is to be distinguished, are now in England.

As, however, it is found in several localities in the South of France—as Lattes, near Montpellier, Agen, Cavaillon, Cassis, near Marseilles (this variety has been distinguished as *Lorteti*)—there ought to be no difficulty in clearing up the matter. The points of distinction principally relied on, which seem to be the narrower more pointed perianth segments and larger eye of *Oculus solis*, may be constant; though I am inclined to doubt it.

T. præcox is one of the earliest flowering Tulips, being usually out by the end of March or beginning of April, and grows to nearly two feet high. The form called *Maleolens*, which is found near Florence and Lucca, is dwarfer, and has an unpleasant smell. I have never seen it alive, but Mr. Strangways, who cultivated it, as well as the Eastern form from the Euphrates, considered them both to be forms of *Oculus solis*.

T. montana, Lindl., "Bot. Reg.," 1106. This is a species which, though widely distributed through Western Asia, from Armenia to Afghanistan, does not appear to be now in cultivation. The colour is bright crimson in the plant figured by Lindley, but the principal character by which it may be distinguished from other Oriental Tulips is the dense wool which covers the interior of the bulb coats. These in wild specimens are very often produced into a long neck, and are much more conspicuous than they would be in cultivation. I have often noticed in the imported bulbs of Tulips, Croci, Watsonias, and other plants which are natives of countries subject to long and severe droughts, that the annually formed coats of the bulbs do not decay for many years, and by their great thickness no doubt protect the bulbs which they cover from the effect of drought. In cultivation, however, they are not nearly so highly developed or conspicuous, so that one would hardly recognize the plump thin-skinned bulb which is produced under good cultivation.

T. chrysantha, Boiss. This appears to be a very distinct

species, though allied to the last by its woolly bulb coats. It is known by its smallish yellow flowers, dwarf stem and sharply undulated leaves, with cartilaginous margins, and has not, as far as I know, been brought into cultivation. It is a native of Northern Persia, Bokhara, Afghanistan, and Beloochistan, where it is very abundant in the Brahui hills at five thousand to six thousand feet. According to Stocks, the bulbs are collected and used for food, resembling chestnuts in flavour.

T. Lehmanniana, Mercl., seems very near, if not identical, with it, though it is kept separate by Dr. Regel in his "Flora Turkestanica."

* *T. Clusiana*, Vent., "Red. Lil.," t. 37; "Bot. Mag.," t. 1390. This, the well known Lady Tulip of the South of France, is one of the most distinct and beautiful of the genus. Its flowers are small, of a rose colour outside and white inside, with a large deep purple eye, yellowish ovary, black filaments and anthers. It is abundant on the Riviera, flowering in April, and produces numerous small bulbs, though few strong enough to flower. It is said to be found also in Greece and the Levant, though I have not seen authentic specimens from thence.

Very nearly allied to it, though, as I should say, distinct, is * *T. stellata*, Hook, "Bot. Mag.," t. 2762; a Tulip of a very similar form and habit to the last, but having a whitish or yellowish flower without the distinct purple eye, and yellow filaments and anthers. It is found in Kashmir, Kumaon and other districts of the North West Himalaya, where it flowers very early in the year, at five thousand to eight thousand feet elevation. Imported bulbs bloomed in my garden soon after Christmas, 1877, but in the following year not till April or May. Like the last species, it produces small off-sets at the end of stolons, and seems, like all other Tulips, perfectly hardy.

T. sogdiana, Bunge. This is a very little known and doubtful species from the deserts near Bokhara, which is described by Regel as having the eye and habit of *T. biflora*, but differs in its leaves and in its woolly coated bulbs.

* *T. Gesneriana*, L., "Bot. Reg.," xxiv., t. 46. It is extremely difficult to say what plant can be rightly considered as the type of *T. gesneriana*, the species being very variable, and having a wide range from Italy through Greece, South

Russia, Asia Minor, and probably Central Asia, but the very fine plant figured in the plate above referred to, which comes from Florence and grows wild in other parts of Italy, is one of the finest and most distinct. It is usually grown in Holland as *T. fulgens*, and though Mr. Baker separates it as a distinct species, I am unable to see sufficient reason for so doing. He includes under *T. Gesneriana* the following supposed species: *T. armena*, Boiss. "Diagn.," ser. 2, iv. 99, Armenia; *T. spathulata*, Bert., from Florence, probably the same as the garden *Fulgens*.

* *T. Schrenki*, Regel, "Enum." 52, from Soongaria and Turkestan. Under the name of *T. Gesneriana* var. *Schrenki*, I have received from Dr. Regel a Tulip which appears to be identical with, and probably the origin of, the spring bedding tulip, well known and commonly grown under the name of Scarlet van Thol. Except in its very early flowering habit it seems to me to have no connection with the common Van Thol, *T. suaveolens*, Roth., "Bot. Mag.," 839, and still less with the Italian *T. Gesneriana*.

T. Gesneriana fulgens, as it would be best to call the variety now under consideration, may be known with ease, by its great height, about two feet, its very large full and bright crimson flower, with deep blue-black eye, large yellow capitate stigma, and long black anthers and very short filaments. A very near ally to *Gesneriana*, and, in my opinion, only a variety of it, is

* *T. platystigma*, Jord., "Icones," 8, t. 16, which, as far as I know, is found wild only at Guillestre, in the department of the Hautes Alpes. The plants which I received through the kindness of my friend, Herr Max Leichtlin, from the Imperial Botanic Gardens of Vienna, and which were pronounced by Mr. Baker to be *T. platystigma*, are similar in habit and time of flowering to *Gesneriana fulgens*, only a little less in height and size of flower and with similar stigma and anthers. They may, however, be recognized by the magenta or pale purple colour and pale blueish eye, margined with whitish. This species (?) is not recognized in Grenier and Godron's "Flore de la France," the Guillestre plant being referred to *T. didieri*.

T. bithynica, Baker ex Grisebach, J. L. S., 1874, xiv., p. 282. This Tulip, which according to Mr. Baker is Grisebach's *bithynica*, seems to occur in most parts of Asia Minor, as I have myself found it in Lycia, and have received bulbs from

Broussa from Mr. G. Maw, from the Taurus, collected by Mrs. Danford, and from Erzeroum. It is a very pretty dwarf species not exceeding 6 to 9 inches high, and usually shorter, and may generally be recognized by its four leaves, which extend at right angles from the stem in the form of a cross. The lower leaf is broad, the others becoming much narrower, and all are deeply channelled and waved at the edges. The colour is bright cherry red, rather duller on the outside, with a black eye margined with yellow. The inner perianth segments are obtuse, nearly half an inch shorter than the outer ones, which are pointed. A plant of this species from the Taurus, which I sent to M. Boissier, was, he thought, the same as his *T. undulatifolia*. If this is correct, the plant I have treated of as *undulatifolia*, which is distinct, must have another name. Grisebach's plant, which I have seen in the Kew Herbarium, appears to me very doubtful, and unless better specimens exist, it is not possible to identify it certainly. The Tulip under notice seems to me extremely near, if not identical with

T. Alberti, Regel, "Garten Flora," t. 912, from Turkestan. A bulb of this species, for which I am indebted to Dr. Regel's kindness, flowered with me this year, and except that the segments were longer, more pointed, and subequal (in which I notice it does not agree with the figure in "Garten Flora," which has the inner segments much blunted and more notched than in my plant), it corresponded precisely with *T. bithynica*. I observed, however, that the anthers are yellow, on very short black filaments, while in *T. bithynica* the anthers were blackish or olive green.

T. undulatifolia, Boiss., Diag. v., 57; "Bot. Mag.," 6308. This handsome species was not known in a living state till I found it on the Bozdagh Mountains, 50 miles east of Smyrna, at an elevation of 3,000 to 4,000 feet, and brought it to England in May, 1874. It is characterized by the closely undulated edges of the leaves, which however, is much more conspicuous in a wild state than in cultivation; and by the pointed perianth segments, which are bright crimson, with a black eye and yellow border inside, and dull greenish crimson on the outside.

A plant found by Mr. G. Maw near Smyrna comes near to my plant, but has a yellow eye showing also on the outside of the flower, and flatter leaves. The plant seems nearly related

to *T. Eichleri*, and as I have already mentioned may not be identical with Boissier's *T. undulatifolia*.

T. bæotica, Boiss. and Held., Diagn., ser. ii.—iv., 99. This species I have never seen in a living state, and do not know that it is now in cultivation. It was discovered by Dr. Heldreich in Eubœa and Bœotia flowering at the end of March, and is said by Mr. Baker to hold an intermediate place between *T. oculis solis* and *T. strangulata*. The leaves of some specimens which I have seen are very short, and if constant in form would be a good distinguishing character.

* *T. Didieri*, Jord., Fragm., i. 36, t. 5, fig. *a*. This pretty plant seems to be very little known either to horticulturists or botanists, since no figure of it has been published except by Jordan. There are several varieties differing in colour, all of which are found in the valleys of Savoy, especially at St. Jean de Maurienne, which is a little way on the French side of the Mont Cenis Tunnel; also at Clapet, near Chambéry, and elsewhere. According to Mr. Baker, the Florentine *T. Fransoniana*, Parl., is probably identical with it; but I have not been able to procure living specimens for comparison. The stem is about 1½ feet high, glabrous, the flowers crimson, with a large black blue eye, margined yellowish white; or in the variety *Billetiana*, yellow; or in another variety yellow, closely freckled and flamed with red. The segments are all cuspidate, the stigma capitate yellowish, and the anthers and filaments blackish. I can see no character by which this plant can be distinguished from

* *T. Eichleri*, Regel, "Garten Flora," t. 799; "Bot. Mag.," t. 6191, which, though coming from so distant a locality as Baku, on the west shore of the Caspian Sea, is in every important external character identical with one variety of *Didieri*, though perhaps in size and colour somewhat finer.

T. Julia, Koch, Linn. xxii., 23. This I have never seen either a specimen or figure of; but according to Baker it is a variety of *T. montana*, and the description shows that it is not very dissimilar from *Eichleri*. It comes from Transcaucasia and Turkestan.

* *T. Greigi*, Regel, "Bot. Mag.," t. 6177. This is, without doubt, one of the finest, if not the very finest, of the genus, and most distinct. It is from a foot to eighteen inches high with three or four large leaves of a pale green, richly spotted

with oblong purplish blotches. The upper leaves are usually sharply waved at the edges, and much narrower than the lower ones. The perianth segments are very blunt, of a deep fiery scarlet, marked at the base with a triangular black blotch, edged with yellow. The flower attains a size of six inches in diameter, and when fully expanded in the sun is almost flat. The ovary is very large and capitate, the filaments blackish, and anthers small in proportion.

I have a variety of yellowish red colour, with the blotches on the leaves almost obsolete, and another with yellow flowers and a reddish eye. This noble plant is a native of various parts of Turkestan, and was found by Col. Korolkow, on the Boroldai mountain at 2000 to 6000 feet elevation. It is perfectly hardy with us, and blooms in April or May.

T. Boissieri, Regel. This is a plant discovered by Dr. Roth near Ramleh, in Palestine, which I have never seen in a living state. It may not be a distinct species, but is described as having a purple flower with black eye and linear leaves.

T. Borscowi, Regel, is another obscure plant from the deserts of Lake Aral and Tashkend, which may possibly be only a form of *Oculis solis* or *Didieri*. It is described as having yellow or orange flowers, but, as far as I am aware, has not yet been introduced into cultivation.

* *T. Kaufmanniana*, Regel, "Fasc.," v., 1877, p. 49; "Garten Flora," 906. This very lovely Tulip is one of the earliest in flower and at the same time one of the most beautiful of its section. The flower is developed in advance of the leaves, which at the time of flowering are quite short, and pale glaucous green. The colour is bright carmine outside, deepest on the outer segments, which are bordered with white. The inside is pearly white, with a bright yellow centre and a band of carmine above this. The flower opens nearly flat in the sun, and is about three inches in diameter. A Tulip resembling this in all but colour flowered at the same time, and is probably a variety of it. It is deep primrose yellow, with golden centre and anthers, and if not already named by Dr. Regel may be called after him.

* *T. Haageri*, Held., "Garten Flora," t. 720; "Bot. Mag.," 6242. This resembles *T. Orphanidesi* in some respects, but is dull cherry red instead of orange, has a shorter stigma and longer anthers, and the filaments without pubescence. It has the

stem nine inches to a foot high, and in my plants which were collected by myself in Asia Minor, and also found by Mr. George Maw on the Tahtalu Dagħ, near Smyrna, the stem is decidedly pubescent, whilst in the Greek specimens which I received from Messrs. Haage and Schmidt it is perfectly glabrous. In the Greek plants also I observe a decided pubescence at the base of the filaments. The variability which we find in these characters in the same species seems to me to prove that they are not of sufficient value or constancy to be relied on in classifying the Tulips.

* *T. Altaica*, Pall. "Garten Flora," t. 942. This species, though long known to science, has only lately been introduced to cultivation by Dr. Regel, and is figured by him in a recent number of the "Garten Flora." It has a carmine red flower of moderate size, with yellow eye, stamens and ovary. I am unable to say in what its distinctive characters lie, as the only plant which I have seen in a living state was not perfectly developed. It is a native of the Altai Mountains, at 1000 to 6000 feet.

T. Eumanthiæ, Orph. in Boiss. Diagn., ser. 2, iv., 100. Of this Tulip I know nothing definite. It was discovered by M. Orphanides on Mount Malevo in Laconia, and is described as having a flower very similar to that of *Eichleri*. It may be probably a form of that species.

* *T. Kolpakowskyana*, Regel, "Garten Flora," t. 951. This pretty little species has been lately discovered in Turkestan, from whence it was introduced and liberally distributed by Dr. Regel. It appears very variable in colour, the three bulbs which I have flowered being all different. It is about 8 to 10 inches high, with glabrous stem, equal cuspidate segments, and a slightly capitate stigma, leaves deeply channelled. The colour is either bright cherry red, with a black eye, purplish black anthers and filaments; or yellow, flamed reddish on the back of the three outer segments; or pure yellow, with blackish eye and yellow anthers and filaments.

T. Korolkowi, Regel, "Descr. Fasc.," III., 1875. This species, which I have never seen, is described as being allied to *T. Eichleri*, but smaller and distinguished from it by the shape of the outer segments, and glabrous leaves and stem. It is a native of the deserts between Khiva and Tashkend, near Tarisch.

T. Kesselringi, Regel, "Garten Flora," t. 964, is described

as allied to *Gesneriana* and *Kolpakowskyana*, but the characters which are relied on to distinguish it do not appear to me well marked. As figured in the "Garten Flora," it has narrow glaucous channelled leaves, a pale yellow veined flower, flamed reddish on the back of the outer segments, a nearly simple stigma, minute anthers and very short ovate filaments. It was discovered by Herr A. Regel in Turkestan.

* *T. sylvestris*, L., "English Botany," t. 63; "Bot. Mag," 1202. This, the only Tulip indigenous to Great Britain, has an extremely wide range through Europe and Asia, and is the type of a section of the genus distinguished by their usually yellow flowers, often two or three in number, by the simple ovary, and by the bulbs being often stoloniferous. The species or varieties allied to it are

* *T. Biebersteiniana*, Schultes, a small form of *Sylvestris*, found in South Russia, Greece, Turkestan, and perhaps in Asia Minor.

T. turkestanica, Regel, is perhaps a variety of this.

* *T. tricolor*, Led, "B. M.," 3887. *T. patens*, Agardh. A form distinguished by its colour, which is pink, white, and yellow. It is found in the Aral and Altai Mountains, and other districts of West Siberia. It is rare in cultivation, but was sent me in flower this season by M. Vander Swaelmen, of Ghent.

* *T. fragrans*, Munby, Bull. Bot. Soc. France, xiii., 256. A small form discovered in the province of Oran, North Africa, by the late Mr. Munby. It has a decided though not powerful scent, and resembles *T. sylvestris* very closely in everything but size.

* *T. biflora*, L., "Bot. Reg.," 535. This, the smallest of all the genus excepting the *Orythias*, has white flowers about one inch in diameter, with a yellow eye. It is not more than four to six inches in height and seems somewhat delicate, as, though I have had it four or five years in cultivation, it has never flowered. It seems to be a perfectly distinct species, and is a native of the plains of South East Russia, about Sarepta and the shores of the Caspian Sea.

T. cretica, Boiss. et Heldr., "Diagn." xiii. 19; "Garten Flora," 1862, p. 211. This very dwarf species is found on the mountains of Crete, and also according to Regel in the province of Azerbaijan in the Eastern Caucasus. It has a stem only two or three inches high, and small rose coloured flowers.

* *T. pulchella*, Fenzl., "Bot. Mag.," 6804. This pretty but

very dwarf Tulip was discovered by Kotschy in the Cilician Taurus, and brought by him to the Botanic Gardens of Vienna, from whence it has come into cultivation in England. It has the filaments hairy at the base, as in *T. saxatilis*, but is very distinct from that species; and though Regel makes it a sub-species of *Sylvestris*, I think it is better considered as distinct. Like all the *Sylvestris* group it has a perfectly simple stigma. The flowers are pale purplish, the leaves narrow and channelled, and the stem not more than two inches high.

* *T. Orphanidesi*, Bois., *T. Minervæ*, Orph., "Bot. Mag.," 6310. Found at Oropo in Bœotia, and on Mt. Malevo in Laconia by Prof. Orphanides, and introduced to cultivation three or four years ago. This is a strong growing species of the *sylvestris* group, with yellowish red flowers tinged with greenish on the outside, and a dark eye, black blue anthers, and olive pollen. It is about 18 inches high, and though nearly allied to *sylvestris* and treated by Regel as a variety only, seems to me to be distinct enough to merit specific rank.

T. Lownei, Baker. This is a small two-flowered plant found on the top of Mt. Hermon. The only specimens I have seen are in the Kew Herbarium, and are not sufficient to decide whether the species is distinct. It seems very near *T. cretica*.

* *T. saxatilis*, Sieber, "Bot. Mag.," 6374. This very distinct and beautiful species appears to belong to the *sylvestris* section, but is easily distinguished from any other Tulip by its colour, which is pale magenta with a deep yellow centre. The leaves, which are usually three in number, are of a very bright shining green, unlike those of any other species known to me. The flowers are two or three in number, and the base of the yellow filaments are clothed with hairs. It is a native of Crete, where it grows at Cape Maleca, near the sea shore. Bulbs of this lovely plant were sent to Mr. Maw by Consul Sandwith in 1877, and have flowered in my garden and elsewhere.

T. violacea, Boiss. et Buhse, "Reise Trans. Cauc.," 211. I know nothing of this plant except from the description in the work cited above. It is said to resemble *T. Clusiana*, but to differ in the smaller flowers, narrower leaves, and especially in the absence of any woolly lining to the bulb coats. It was found on the Talysch Mountains, in North Persia.

* *T. australis*, Link.; *T. Celsiana*, "Redouté Lil.," t. 38 ;

T. Breyniana, "Bot. Mag.," t. 717. This well known species is common in the South of France and North Italy, and is also found in Spain and Portugal. It is easily distinguished from *T. sylvestris* by its dwarf habit, star shaped flowers, and broad somewhat reflexed leaves. It is commonly known as the Persian Tulip in gardens.

T. transtagana, Brot., from Portugal, and *T. alpestris*, Jord., from Dauphiné, seem to be varieties of this species. There are two or three species or varieties nearly allied to it, namely, * *T. gallica*, Lois, "Gren. Flore de la France," III., 178, a doubtful species which seems very near the last. A living plant which I received from the Jardin des Plantes at Paris, was identical with it, whilst specimens in the Gay Herbarium at Kew are marked by him as hardly separable from *T. sylvestris*, which, indeed, they resemble much more nearly than *australis*. It is found at Draguignan, Le Var, and Hyères in the South of France.

There is another form of Tulip differing from *T. australis* remarkably in its leaves, which are straight, linear and deeply channelled, though the flowers are quite similar to those of *australis*. I am ignorant of the origin of the plant, which has flowered three years in my garden, and shows no signs of losing the distinctive character of its foliage.

There is also a very minute Tulip which may possibly be a local form of *australis*, which was gathered at El Kantàra, on the borders of the Sahara, by Mr. Hammond, of St. Alban's Court, Kent. The flower seems pinkish, and the leaves are very small and narrow. I am indebted to Mr. Hammond for a living plant of this form, which does not appear to have been noticed by any botanist.

* *T. triphylla*, Regel, "Garten Flora," t. 942. This species, recently introduced from Turkestan, seems to me very nearly allied to *australis*, and even if distinct, the name is not appropriate, as among the plants which I received through the kindness of Dr. Regel, one had four leaves; and the number is variable in almost all the species. The peduncle is reflexed when in bud, as in *T. australis*, and the flower is greenish yellow.

T. crispatula, Boiss. and Buhse, "Reise Trans. Cauc.," p. 211. This is another obscure form, said to be allied to *T. Biebersteniana*, but differing in the wider leaves with undulated margins, in the

reddish flower, and the less woolly coat of the bulb. It was found by Buhse between Damgan and Rischm, in Transcaucasia.

T. humilis, Herb., "Bot. Reg.," 30; Misc. 30. *T. Buhseana*, Boiss. This is considered by Regel as only a variety of *T. biflora*, but I have never seen specimens which would enable me to form an opinion as to its validity. It is found on the mountains of North Persia at 5000 to 7000 feet elevation. The flowers are said to be pale yellow marked with reddish on the backs of the outer segments.

T. microgyna, Baker. A small plant found on Mount Ida, in Asia Minor, by Ancher Eloy, having a yellow flower tinged reddish outside, and a very minute ovary, only two and a-half lines long in the specimens examined.

T. tetraphylla, Regel, "Descrip. Fasc.," III., 1875. A small plant found in the valley of Kotschkura, in Turkestan, by Baron Kaulbars. It is said by Regel to be distinct from the *sylvestris* group.

Besides the Tulips which I have recognized as species, there are several others holding that position in Mr. Baker's revision; but as they are either known only in gardens, or as I think without good distinctive characters, I should at present be disinclined to allow their specific rank. They are—

T. campopetala, Delaunay. "Bon. Jard.," 269, 1813. A red and yellow form of *Gesneriana*, only known as a garden plant.

T. elegans, Baker. A garden form, supposed by Mr. Baker to be a hybrid between *acuminata* and *suaveolens*.

* *T. pubescens*, Willd, Sweet's "Brit. Flow. Gard.," t. 78. Another form to which many of the garden varieties seem to be akin; perhaps it may be a hybrid between *gesneriana* and *suaveolens*, but its origin is extremely doubtful.

* *T. suaveolens*, Roth., "B. M.," 839. This, the common early red and orange *Van Thol* Tulip, though treated as a species by Mr. Baker, who refers it to plants gathered by Pallas and Steven on the shores of the Caspian Sea, appears to me doubtful. It must not be confounded with the scarlet *Van Thol* which I have already alluded to, and is not recognized by Dr. Regel as a Russian plant.

* *T. acuminata*, Vahl., *T. cornuta*, D.C., "Bot. Reg.," 127. *T. turcica*, Kunth and Regel. This species, usually known as *T. turcica* in gardens, is of uncertain origin, no wild plant at all like

it being known; for though Mr. Baker suggests that it may have sprung from *T. bithynica*, I must say I see no resemblance whatever between the plants. It may easily be known by its long narrow-pointed perianth segments, and varies with red, yellow, and speckled flowers.

T. retroflexa, Baker. This is another form well known in gardens of which the origin is unknown. It is, however, as Mr. Baker suggests, very probably a hybrid between *T. acuminata* and *T. gesneriana*. It flowers late like the last two, attains about two feet in height, and varies with pure yellow, and red flowers with a yellow eye.

T. strangulata. Reboul, "Bot. Reg.," 1990, fig. 3. This is one of several supposed species which seem to be confined to the environs of Florence, and in my opinion are not worthy of specific rank, if indeed they are indigenous plants. Mr. Joad informs me on the authority of Mr. Groves, of Florence, that in an old work on the botany of that town, published 100 years ago, the only Tulip given as a wild plant is *T. sylvestris*, and it certainly seems almost incredible that two or three distinct species should be so restricted in their range as these appear to be. It is more probable that these are garden varieties which have escaped from cultivation, and become naturalized in the neighbourhood of the town.

The other Florentine species are *T. Fransoniana*, Parl., "Flor. Ital." II., 392; *T. variopicta*, Reboul, Select Sp. Tulip 7, "Bot. Reg.," t., 1990, fig. 1; *T. Bonarotiana*, Reboul, "Bot. Reg.," 1990, fig. 2; *T. neglecta*, Reboul, Select Sp. 7; *T. serotina*, Reboul. Select Sp. 6. Another garden Tulip which seems to me worthy of notice is one well known to Dutch florists as *T. Purple van Bol*, which flowers extremely early, and is said never to produce off-sets. It is about a foot high, with blunt acuminate segments of a purplish claret colour, with yellow eye, yellow anthers and filaments, and a capitate stigma. I am inclined to think that this may be a wild species of which the origin is lost, but in any case it is a distinct plant.

P.S. I have just received from Dr. Regel two tulips not mentioned in this paper, viz. :—

T. iliensis, from Turkestan, of which I have not yet seen a description, and *Orythia uniflora* Don. "Sweet Brit. Flow. Gard.," ser. II., t. 336.

Royal Horticultural Society.

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VOLUME V.



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Salvia elegans	xxi.
Savoy, Subterranean Buds on	xxxv.
Scilla italica	xlvi.
Sequoia sempervirens, Exerescence from stem of	cxxiv.
Skeleton Leaves	lxiv.
Sugar-cane Disease	lxii., lxvii., lxxiv.
Tea Disease	lxx., lxxiii.
Torenia Bailloni	lxxv.
Tritoma, Rate of Growth	xxi.
Trichomanes alatum	cxxxiii.
Tulipa gesnerianaxxxiv., xlvi.
„ Van Bol	xli.
Turkestan, Flora of	xli.
Vanda suavis, Terminal Inflorescens	cxxv.
Vegetable Marrow, Monstrous	lxxxviii.
„ Remains in River Gravel	cii., cxxiii.
Victoria, Photographs of Scenery in	cxxvi.
Vines from Peru, Insects in	cxxxviii.
Virginian Creeper	lxxiv.
Vitality of Seed	lxxi.
Welwitschia, Insects in	cxxxviii.
Xephion Caucasicum	xliii.
Yew, Diseased	xxi.

EXTRACTS FROM THE PROCEEDINGS
OF THE
ROYAL HORTICULTURAL SOCIETY
OF LONDON.

JANUARY 15, 1878.

ORDINARY GENERAL MEETING.

HENRY WEBB, Esq., Vice-President, in the Chair.

THE Minutes of the last Meeting having been read and confirmed—

Mr. Wooster observed that the bye-law requiring the Fellows' nomination papers to be suspended in the Council Room had not been put in force for some time.

Mr. Haughton said that it was several years since the mode of procedure prescribed by the bye-laws had been observed in this particular. As a formality the omission was doubtless improper, but attention having been drawn to it, care would be taken in future to conduct elections strictly according to the bye-laws.

Elections.—W. S. Amies, Mrs. Carew, Mrs. W. Earle-Leigh, H. C. Frettingham, F. Gallop, Colin Lindsay Herford, Carl Jay, Major Wm. Kennedy, J. T. D. Llewelyn, Hon. Mrs. Chas. Spring Rice, Lieut.-Col. C. Salkeld, Martin J. Sutton.

Dr. Hogg commented upon the several subjects brought under the notice of the Fruit Committee; and the Assistant-Secretary,

Mr. Samuel Jennings, dealt with those that were submitted to the Floral Committee.

Mr. David Wooster, alluding to the death of Mr. Andrew Murray, made a proposition, which Mr. Colebrooke seconded, to the effect that it be recorded in the Minutes of the Meeting that the Fellows present, keenly feeling the great loss which the Society had sustained by the death of Mr. Murray, resolved that a letter of condolence be sent to his widow and family.

SCIENTIFIC COMMITTEE.

SIR. J. D. HOOKER, C.B., Pres. R.S., in the Chair.

Peach-roots.—Dr. Masters showed specimens of deformed Peach-roots, already brought under the notice of the Committee, which had been kept in a damp place and had thrown out adventitious shoots. Mr. Worthington Smith showed similar specimens.

Colletia cruciata.—Dr. Masters showed a specimen from Sig. Fenzi, of Florence, in which from a shoot of *C. cruciata* a branch with many of the characteristics of *C. spinosa* had sprung.

Carnivorous Plants.—Sir George Macleay sent a leaf of *Dionæa muscipula* on which a slug was placed on December 4th, and a fragment of leaf of *Aspidistra* on which another slug was placed a few days later. In the case of the *Dionæa* the body of the slug became reduced to pulp, but was not attacked by mildew. On the *Aspidistra* the body of the slug became covered with mildew, and ultimately dried up. No fungus was observed on the leaf of the *Aspidistra*. Various specimens of rare *Bauhinias* and other plants were sent from the same garden.

Fungi of the Vine.—Dr. M. C. Cooke read a paper on this subject, which will be found in the Society's Journal.

Fossil Fungus.—Mr. Worthington Smith showed specimens of the Fossil Fungus allied to the Potato Fungus, and showing the jointed threads, the oospores with zoospores *in situ*.

Eccentric Growth of Timber.—Sir Walter Trevelyan sent, through Mr. Wooster, a remarkable specimen.

Cryptotype.—Mr. Worthington Smith showed a portrait of the President photographed direct on to the wood by his new process, and remarked that the specimen of wood above referred to was

photographed on to the wood in the same way, and directly engraved from the photograph for the *Gardener's Chronicle*, without any pencil drawing on the wood being made.

The late Mr. Andrew Murray.—At the suggestion of Sir Joseph Hooker, a letter of condolence with the widow and family of the late Mr. Andrew Murray was directed to be sent, the President undertaking, on the part of the Committee, to carry out its wishes in the matter. It was further resolved that a Minute be made in the record of the Proceedings of the Committee expressive of their sense of the great loss they have sustained by the death of so valued and active a member.

FLORAL COMMITTEE.

First-class Certificates awarded to Mr. B. S. Williams, for *Dendrobium superbiens* and *Microlepia hirta cristata*; and to Mr. W. Bull, for *Zamia corrugata* and *Z. lucida*. Botanical Commendation awarded to Mr. B. S. Williams, for *Pterostylis Baptistii*. Vote of thanks awarded to Mr. W. Bull, for collection of new and rare Cycadaceous plants; to Messrs. James Veitch & Sons, for collection of Orchids, &c.; to Mr. B. S. Williams, for collection of Orchids, &c.; to Messrs. J. Wills, for collection of Orchids and Foliage Plants; to Mr. H. Cannell, for cut blooms of Pelargonium; to Mr. W. Wildsmith, gardener to Lord Eversley, Heckfield Place, for cut Poinsettias; and to Mr. J. Ollerhead, gardener to Sir H. W. Peek, M.P., Wimbledon House, for *Odontoglossum cirrhosum*, var.

FRUIT COMMITTEE.

First-class Certificate awarded to Messrs. Rivers & Sons, Sawbridgeworth, for fruit of Long Orange. Cultural Commendation Certificate awarded to Messrs. Rivers & Sons, for collection of ten varieties of Dessert Oranges; and to Mr. Atkins, gardener to Col. Loyd Lindsay, M.P., Lockinge Park, Wantage, for four bunches of Muscat of Alexandria Grapes, and one of Black Alicante Grapes. Votes of thanks were awarded to Mr. Miller, gardener to the Earl of Craven, Coombe Abbey, for six bunches of Gros Guillaume Grapes, weighing 26 lbs; and to Mr.

L. A. Killick, Langley, Maidstone, for a very fine collection of Apples.

FEBRUARY 12, 1878.

ANNUAL GENERAL MEETING.

The Right Hon. Lord ABERDARE, President, in the Chair.

The Members of the Council present were Lord Alfred S. Churchill, Major R. Trevor Clarke, Major Mason, Dr. Denny, Mr. W. B. Kellock, Mr. William Haughton, Mr. Henry Webb (Treasurer), and Dr. Hogg (Secretary). Amongst the Fellows present were Mr. A. Grote, Mr. G. F. Wilson, F.R.S., Mr. Wills, Mr. Guedalla, Mr. Bateman, F.R.S., Sir Trevor Lawrence, &c.

Mr. S. Jennings, the Assistant Secretary, read the minutes of the last Annual General Meeting, which, upon the proposition of the President, were confirmed.

The President said the next business before the meeting was the nomination of the Expenses Committeemen and of the Auditors. The names were in the list which was in the hands of the Fellows. The Expenses Committeemen proposed were Mr. F. Campion, Mr. Henry Webb, and Mr. William Haughton; but, unfortunately, Mr. Campion had sent in his resignation, and was therefore disqualified from filling the office, and the Council asked that the name of Lord Alfred S. Churchill should be substituted. One of the Auditors, Mr. Charles Edmonds, had removed into the country, and was consequently unable to perform the duties of an auditor, and hence the Council proposed the name of Mr. R. A. Aspinall, who had kindly consented to undertake the duties of an auditor. This was agreed to.

The President said the next business was to appoint scrutineers for the ballot, and he had to submit the names of Messrs. Lee and Bull. This was also agreed to.

The President.—The next duty I have to discharge is to propose that the report of the Council should be read; but probably

it will be on this occasion, as it usually is, the desire of the meeting that the report be taken as read, inasmuch it has been for some time in the hands of Fellows (hear, hear). That being so, I hope the Fellows will agree with me and my colleagues that the report is an encouraging and cheering one (hear, hear); that it exhibits signs, not of disappointed hopes almost brought to the verge of despair, which was the case in some of the preceding reports of the Council of this Society, but that it is one full of animation and of the promise of a healthy life (hear, hear). We met last year under many advantages, but still many discouragements. These were the falling-off of a considerable number of the Fellows, caused to a very large extent by the great disunion which existed up to that time in the Society. The number of Fellows up to the last two years had been steadily decreasing, and that decrease went on at an accelerating ratio; and the result is, that although during the last year we may be considered to have very much recovered ourselves, the whole number of Fellows is less at this moment than it was at the commencement of 1876. Still, the accession of numbers last year has been very considerable (hear, hear); and great a sign as this is, we have also other signs that there is a returning confidence of the public towards this Society. The report shows you that while during the past year seventy-nine Fellows resigned and sixty Fellows died, we have had an accession of no less than 255 new Fellows, and 231 guinea members, so that you see, in point of fact, the increase of numbers was very great (hear, hear). That is really a fact which ought to be steadily borne in mind when the prospects of the Society are taken into consideration. But this is only one symptom of reviving confidence in the Society. Another cause of encouragement is, that the disputes which unfortunately hitherto existed in our meetings, and which undoubtedly produced a very bad effect in the minds of the public, have entirely disappeared. That, too, I consider is a gratifying announcement to be able to make (hear, hear). The Society determined to avail themselves of this new feeling of confidence by great exertions on their part; and these exertions, I am happy to say, have been successful. It will be agreed, I am sure, on all hands that the fortnightly shows which the Society has held were not only equal but much superior to those of former years, whether as regarded their value in a scientific point of view, in one of horticultural interest, or their external beauty (cheers). In no year have we had any more magnificent shows (hear, hear). Then, again

beyond that we have the very best practical proof, in the shape of our very large receipts, of the increased prosperity of our shows and of their increased popularity, when we were able for the first time to invite Her Majesty to these gardens, and also the Prince and the Princess of Wales. I say for the "first time," because I, as President of the Society, steadily refused to invite Her Majesty here until the unhappy dissensions in the Society had disappeared—until there was some sort of general concord amongst its members, and a reasonable hope that harmony was established (hear). We have had the advantage of the presence of the Queen, accompanied by some of the Princesses, and afterwards of the presence of the Prince and Princess of Wales, as well of the Duke of Teck, the President of, not the rival, but the sister Society—the Botanical Society—accompanied by the Duchess. The result of all this is, that while in 1875 we received from our exhibitions only £222, and in 1876 only £223, we actually received in 1877 from our exhibitions £812 (cheers). The daily admissions rose last year to £484, while in the preceding year they only amounted to £245. Then as regards our garden produce, while we sold it to the amount of £340 in 1876, last year it realised £577. All these things show a very great advance on the part of the Society, an improved condition of things in most important points (hear, hear). There is one other little matter which I think I should bring under your notice before I sit down, and that is the disappearance from the accounts of the £1700 which was placed to the credit of our provincial shows. The provincial shows of the Society had been highly successful, and the existing Council of the day—as they had a perfect right to do—placed the balance of receipts or surplus arising from those shows to a separate account, which was to form a guarantee fund for provincial shows in the future, as they were found to be of great advantage to the Society. But, in other times, another Council which was appointed found themselves in embarrassments and difficulties, and they appropriated this sum of £1700, so specially set aside for a special purpose, to supply the general necessities of the Society. I have no doubt they had a legal right to do so. It may have been unfortunate that they did so, but I think they had as much right to get the money for the general wants of the Society, as the previous Council had to say the £1700 was to be specially devoted to provincial shows. The Council thought and felt they had an equal right to say, "It was all very well to set it aside, but now we will apply it to the general

wants of the Society." At any rate, whether my view is right or not—and I am bound to say it was confirmed by the opinion of an eminent counsel—the omission of that item from our balance-sheet was actually forced upon us by the auditors, who refused to sign our accounts so long as that item of £1700 appeared in them as a fictitious one. We have, as to our future provincial shows, entered into a contract with those who will assist us that, with respect to any surplus to be set aside, neither the Council nor any other body shall have power to lay their hands upon it for any other purpose than that intended by the trustees (hear, hear). I assure you, therefore, that during the last year we have shown very considerable symptoms of reviving prosperity. We have had a large increase in the number of Fellows, and I have every ground for hoping that the returning flood of prosperity will continue during the present year (cheers). The only way we can increase our revenue, having tried every other means, is by showing the public we are exerting ourselves to do our best, by showing horticulturists we are doing our utmost to advance the interests of horticultural science, and by showing those who live in this neighbourhood that the Council are making the attractions of these gardens as great as possible (hear, hear). I mention this because a gentleman—and I am not aware whether he is present in the room or not—has written to me to say he should move for the appointment of a committee of Fellows, who should institute an inquiry to see what can be done to promote the interests of the Society. Well, I think we had quite enough of these committees of inquiry (hear, hear). I know very well that in many cases of contingency and emergency there is a very great advantage in the appointment of such a committee of inquiry, but at the present time the appointment of such a committee would only show the existence of differences which do not exist (hear, hear, and cheers). I may say without presumption the Council does possess the confidence of the Fellows, and we are all convinced that anything like a suggestion of disunion must, at the present stage of our history, be of a very injurious character (cheers). A friend of mine who always says wise things and often witty ones, speaking a short time since of the visit of the Queen to the show, and then talking of the services of my friend on my right (Dr. Hogg) in the science of pomology, remarked that besides promoting the cultivation of Apples, the Council had been successful in expelling the apple of discord (cheers and laughter). I hope it has been thoroughly ex-

tirpated, and therefore I am very anxious that nothing should be done to show the appearance of want of harmony in the Council (hear, hear). We are giving the strongest outward visible signs to the public of our existence and of our capacity for usefulness. Last year, from all the information I have received, our shows were not—could not be—surpassed in usefulness and brilliancy; but I believe they will even be surpassed by the shows of this year. We have made arrangements for an exhibition in May extending over four days; and we have made preparations for holding a show at Preston which will also last four days, and I hope it will be an accession not only of revenue but of credit (hear, hear). The only cloud hanging over our fortunes is the existence of the arrangement entered into with Her Majesty's Commissioners as to the termination of our agreement with them in case that at the end of December this year we should not have an income of £10,000. Well, our income last year amounted to about £5780, which is a long way from £10,000; but considering the great depression which had existed in the country, as well as the general desire of people to diminish their expenditure and not to increase it, that was not a year in which we should expect to do what we pledged ourselves to do our best to accomplish. At the same time I know Her Majesty's Commissioners are watching our proceedings with an attentive eye. I know they are aware we are doing our best to attain the object for which we were incorporated, and that all of them will have the justice to see the difficulty under these adverse circumstances of bringing together within the limit of time stipulated such an income as that of £10,000. Under these circumstances I am strongly inclined to hope—I speak my own opinion—that Her Majesty's Commissioners will extend the period, so as to give us the advantages of the improvements we may not unreasonably look for in those better times when people will be more inclined to become Fellows of the Society than they were during 1877 (hear, hear). Taking all the circumstances together, we may consider that the report which I ask you to adopt presents a hopeful view of our situation, and therefore it is with confidence that I beg to move it be adopted.

Lord Alfred S. Churchill seconded the motion.

Mr. Guedalla took the same view of the situation as their noble President did. Under his able presidency they were slowly mending for the better, and he felt sure that if some arrangement with the Commissioners could be made the Society would be able

in the course of a few years to increase their income to £10,000. When he looked at the great mansions in that neighbourhood he could not but think of the serious injury which would accrue if the gardens were built upon, and it was to his perfect astonishment that all round about in the neighbourhood did not endeavour to keep up the gardens (hear, hear). No doubt horticultural science could be carried on elsewhere than in South Kensington, but was not the latter the place in which the late illustrious Prince Consort, whom they all lamented, initiated the gardens? (Hear, hear.) He should be very pleased if the Commissioners would come down to £7000 income for next year, and that if the income of the Society were so increased the Commissioners would not adopt the strict letter of law. He did not wish to say this in the way of a menace or threat, but the Commissioners must know the Society was not going to surrender without an effort. The Society had done a good deal; there were the debenture-holders' and other interests to be looked to, and he should be very glad in this matter to take the word of their noble chairman that the Council would do their best. With extraordinary aids a forced income might be got together. Above all things he thought it desirable that the Commissioners and the Council should work in harmony together. With these observations he supported the motion for the adoption of the report (hear, hear).

Mr. George F. Wilson was sorry to hear the £1700 was put out of chance of recovery. He spoke feelingly, as he was on the Council when the first provincial show took place. When it was proposed to hold the show, the Commissioners of the Exhibition of 1851 said they could not sanction the expenditure, as it was not for the purposes of the South Kensington estate; but the Council took the responsibility on themselves. He thought it was very hard, that being the case, that the money should go for the general purposes of the Society. It was distinctly said that any money earned by that show should be devoted to horticultural and not to general purposes (hear, hear). He wished to say he should have liked all the guinea members should have votes, and he had reason to know if that were the case there would be a great accession of members. However, it was distinctly said when the guinea members were accepted they should have all the privileges of membership except the vote, and yet he was sorry to find that when the great show was held in June—and one-guinea members took the greatest interest in the shows—an

announcement was made by the Council to the effect that the Fellows and debenture-holders were to be admitted at twelve o'clock, while the guinea members and the public were to be admitted at one o'clock. Now it was, he repeated, distinctly said that the guinea members were to have every privilege with the exception of that of voting. He hoped that would be put right this year (hear. hear). As to the last paragraph in the report, in which the Council "earnestly urge upon the Fellows the imperative necessity of using every effort to increase their numbers so as to comply with the condition imposed by the last agreement with Her Majesty's Commissioners, and secure their tenure of the South Kensington Gardens and the emancipation of the Society from its difficulties," he, for one, hoped that that would be the only tenure by which the gardens would be held.

The President said he strongly agreed with Mr. Wilson that no distinction as to the admission of guinea members should be made. He now put the motion—"That the report be adopted."

The motion was carried unanimously.

The following officers were unanimously elected:—President, Right Hon. Lord Aberdare; Treasurer, Henry Webb; Secretary, Robert Hogg; Expenses Committeemen, Lord A. Churchill, Henry Webb, and William Haughton; Auditors, R. A. Aspinall, John Lee, and James F. West. The names of vacating Members of Council were F. Campion, W. B. Kellock, F.L.S., and T. M. Shuttleworth. The following were elected to fill the above-mentioned ordinary vacancies:—C. J. Freake; Sir Trevor Lawrence, Bart., M.P.; and J. T. D. Llewelyn.

Mr. Wills asked whether any preparations for the show at Preston were going on, and if so if they were progressing satisfactorily.

The President replied that a local committee of influential gentlemen had been appointed, and they were acting with the Council. There was every reason to expect that the show would be a good one, and up to the present moment all the preparations were going on satisfactorily (hear, hear).

Elections.—R. H. Beattie, Mrs. Arthur Blair, Miss Charlotte Bowden, Capt. J. D. Bradley, Hon. Olivia Calthorpe, Rev. W. H. Cariss, James Cawley, Edwin Cooling, Mrs. Dancer, Edmund S. Hanbury, Arthur C. Curtis Hayward, F. Manuelle, Mrs. Mulholland, Maurice Powell, Miss Louisa E. Ramsden, Joseph Rawley, C.

Robson, Mrs. Shadwell, H. T. Smith, W. L. Sutton, S. Webb, S. Woolf, Mrs. Wright.

The meeting then separated.

REPORT OF THE COUNCIL TO THE ANNUAL GENERAL MEETING OF 12TH FEBRUARY, 1878.

The operations of the Society have, during the past year, been carried on with a completeness and efficiency which the Council did not venture to hope for at the time of the last Annual Meeting. The Scientific, Fruit, and Floral Committees were most assiduous in the performance of the duties which they have undertaken respectively, and the results of their valuable labours, and of many of the practical trials and experiments made at Chiswick, the Council hoped would have been made public in the Journal of the Society, which they attempted to recommence. Unfortunately the illness which terminated in the lamented death of Mr. Andrew Murray, whom they appointed to be its editor, prevented this expectation being realised. They have recently obtained the services of Mr. Samuel Jennings in the double capacity of assistant secretary and editor of the Journal, which they trust will shortly re-appear in a form worthy of the Society.

The plants, flowers, and fruit shown at the ordinary meetings of the Society always present objects of great interest from their rarity or unusual excellence in point of cultivation, but the limited space available for their exhibition in the Council chamber necessarily restricted their numbers and interfered with their effective display. To remedy this inconvenience to some extent, and to enable Fellows to enjoy with more comfort to themselves the beauty of these exhibitions, the Council held them in the conservatory during the past season. The experiment proved successful beyond expectation; the cordial co-operation of the chief exhibitors rendered these unpretending meetings worthy of being classed as regular shows. The Council have the gratification of knowing that they afforded much pleasure to the Fellows, and they will resume them in March next. Fellows' tickets and small book orders will admit as on ordinary days. Cards giving

full information as to the dates of the shows and meetings for this year will be ready for distribution as soon after the Annual Meeting as they can be printed.

The magnificent shows which were honoured by the presence of Her Majesty and the Prince and Princess of Wales, and the show of Covent Garden produce, in which the Duke and Duchess of Teck showed a lively interest, were in every respect worthy of the Society. The Council hope that the two former will be quite equalled, if not exceeded, in extent and beauty by the four days' show which will be held in May next.

The Council have during the last two years wished to organise a provincial show on a grand scale; but the practical extinction of the fund formerly set apart for this purpose by the appropriation of £1700 to other uses (which they have been advised cannot be recovered, and which, therefore, does not appear in the balance-sheet), and the failure of their attempts to obtain sufficient local support, have hitherto prevented the accomplishment of their wish. Now, however, a guarantee fund has been raised and arrangements made at Preston which justify the show which has been announced being held there. The form of guarantee provides for the future security from misappropriation of the profits specified in it, and the Secretary will be happy to receive the names of those willing to become guarantors.

At Chiswick many valuable experiments have been made, the results of which will shortly be published in the Society's Journal. The state of the garden is most satisfactory. The great vinery, probably the finest of its kind in the world, the vines in which are twenty years old, produced an abundant crop, which, at the reduced prices at which the grapes were sold to Fellows, realised £320. The vines planted against the glazed wall for identification and description have been removed, and their places will be filled by others bearing fruit of greater value. The vines removed are retained in the garden for distribution to Fellows. Full descriptions of them have been drawn up and will be published. The Peach trees trained as single "cordons" are well worthy of inspection; their crop was good and of high quality. Trials have been made of 77 varieties of Tomatos (some grown in pots, some in the open ground); of 153 samples of Turnips, sown at different seasons; of 67 samples of Savoys, and 183 samples of Cabbages, of all of which except the last reports are ready. The last, which have been tested as to their value for summer and

autumn use, have been again planted to ascertain their value for use in spring. Of most of the typical kinds photographs have been taken. In the present year collections of Peas, Lettuces, Beets, and Leeks will be subjected to critical examination, and experiments will be made on the comparative value of artificial manures. The collection of herbaceous plants has been rearranged and largely added to. The Council have also procured collections of some of the more ornamental kinds of these plants and florists' flowers, including Delphiniums, Pæonias, Pyrethrums, Iris, Ranunculus, Crocus, &c., which have been separately planted. A rockery, for the stone of which the Council are indebted to their Treasurer, Mr. Henry Webb, has been formed opposite the entrance to the great vinery, and planted with rock plants, many of which of great interest were presented by the Royal Gardens, Kew; the Royal Botanic Garden, Edinburgh; Mr. G. F. Wilson, Mr. George Maw, and others. Trials have been made of various kinds of Zonal Pelargoniums (which were successfully grown, both in pots and planted out in the open border), also of varieties of Canna, Begonia, Epacris, China Asters, Stocks, and various sorts of hardy annuals, of all of which full reports have been prepared.

The liberality of Mr. Elwes, a Member of Council, who has procured the seeds of many plants from the Sikkim Himalayas, will enable the Council to distribute some of these, which are of great beauty and rarity, among the Fellows in the course of this year.

The Council are desirous of opening up correspondence with persons residing in the Colonies and abroad who would send home seeds and plants, and they hope that all who can facilitate their efforts in the introduction of new plants will communicate with the Assistant Secretary to that effect.

520 packets of cuttings of fruit-trees, 1695 plants, 195 packets of cuttings of plants, and 15,850 packets of seeds have been distributed among Fellows during the past year.

The mode of heating the glass houses has been altered, and an economy in the consumption of fuel thereby effected.

A new carriage entrance to the garden has been opened.

At South Kensington repairs to a considerable extent have been carried out, but much remains to be done in this respect.

The Saturday promenades recommenced on the 19th January last.

The ordinary receipts for the year have exceeded the expenditure by £11 17s. 2d., to which must be added the sum of £336 19s. 7d.,

levied upon and paid by the Society in past years in respect of rates, which should have been paid by Her Majesty's Commissioners, and which they have repaid to the Society.

The Council hope to be able to continue and extend the operation of the arrangement with the debenture-holders referred to in their recent circular.

During the past year 255 new Fellows and 231 guinea Members were elected ; 79 Fellows resigned, and 60 Fellows died.

In conclusion the Council earnestly urge upon the Fellows the imperative necessity of using every effort to increase their numbers, so as to comply with the condition imposed by the last agreement with Her Majesty's Commissioners, and secure their tenure of the South Kensington Gardens and the emancipation of the Society from its difficulties.

ROYAL HORTICULTURAL SOCIETY.

DR. BALANCE SHEET, 31ST DECEMBER, 1877. CR.

	£	s.	d.		£	s.	d.
To SUNDRY CREDITORS on open Account ...	320	17	9	By CAPITAL EXPENDITURE ...	7232	10	9
„ LIFE COMPOSITION ACCOUNT ...	2903	18	0	„ ANNUAL SUBSCRIPTIONS—			
„ RECEIVED ON ADDITIONAL DEBENTURE (C. J. Freahe)	5000	0	0	Outstanding, 1876 ...	501	2	6
„ SUSPENSE ACCOUNT. Cash received from Her Majesty's Commissioners for unpaid Taxes and Interest thereon to date ...	340	0	0	Do. 1877 ...	444	3	0
„ GENERAL REVENUE ...	522	18	5	„ SUNDRY DEBTORS—	945	5	6
	£9087	14	2	Garden Produce ...	174	11	1
				„ DUE FOR ADVERTISEMENTS—	20	12	0
				J. C. Fox ...			
				„ CASH AT BANKERS—			
				On Deposit Account ...	340	0	0
				On Current Account ...	368	0	9
				„ PETTY CASH IN HAND ...	708	0	9
					6	14	1
					£9087	14	2

JOHN LEE, }
JAS. F. WEST } *Auditors.*

W. HENRY MARSH,
Accountant.

ROYAL HORTICUL

Dr.

REVENUE ACCOUNT FROM 1st

	£	s.	d.	£	s.	d.
To ESTABLISHMENT EXPENSES—						
Salaries	299	8	8			
Wages	189	14	7			
Printing, Stationery, and Cards	176	0	11			
Postages	96	18	9			
Miscellaneous	76	11	1			
Gas	15	9	11			
Library	7	10	0			
				861	13	11
„ SPECIAL EXPENSES in relation to Horticulture—						
Journal	69	1	3			
Fruit and Floral Committees	91	16	1			
Scientific Director	87	10	0			
				248	7	4
„ CHISWICK GARDEN EXPENSES—						
Rent, Rates, Taxes, and Insurance	315	0	7			
Labour	932	12	2			
Implements, Manure, Coals, and Coke	248	5	8			
Repairs	85	1	6			
Trees, Plants, Seeds, &c.	31	11	2			
Miscellaneous	134	4	6			
Superintendent's Salary	150	0	0			
Water	13	5	4			
				1910	0	11
„ KENSINGTON GARDEN EXPENSES—						
Rates, Taxes, and Insurance	581	8	2			
Superintendent's Salary	100	0	0			
Labour	528	5	6			
Repairs	318	9	7			
Coke and Manure	45	8	9			
Implements	34	3	3			
Water	38	8	11			
Miscellaneous	109	6	7			
Reading Room	19	10	11			
Bands	65	0	0			
				1840	1	8
„ EXHIBITIONS—						
Advertising	288	15	0			
Prizes and Medals	208	2	0			
Bands	162	9	6			
Sundries	230	3	5			
Superintendent of Flower Shows	25	0	0			
Judge's Fees	4	4	0			
				918	13	11
„ SUSPENSE ACCOUNT—						
Cash on Deposit				340	0	0
„ Balance				747	5	11
				£6866	3	8

February 5th, 1878.

TURAL SOCIETY.

JANUARY TO 31ST DEC., 1877.

Cr.

	£	s.	d.	£	s.	d.
By 1/15 LIFE COMPOSITIONS as at 1st January ...				737	16	0
„ AMOUNT RECEIVED from Her Majesty's Commissioners in Re-payment of Rates on Annexes	336	19	7			
„ DEPOSIT INTEREST on same ...	3	0	5			
	<hr/>			340	0	0
„ ANNUAL SUBSCRIPTIONS...				3942	4	6
„ EXHIBITIONS ...				812	7	9
„ PROMENADES ...				77	2	3
„ DAILY ADMISSIONS ...				407	1	1
„ GARDEN PRODUCE ...				517	19	5
„ PACKING CHARGES ...				6	6	0
„ MISCELLANEOUS RECEIPTS ...				25	6	8

£6866 3 8

We have examined the above Revenue Account with the Books and Vouchers, and find the same correct,

JOHN LEE,
JAS. F. WEST.

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FEBRUARY 19, 1878.

ORDINARY GENERAL MEETING.

Lord ALFRED S. CHURCHILL, Vice-President, in the Chair.

The Minutes of last Meeting were read and confirmed. The Assistant Secretary announced the awards of the Committees.

Elections.—Douglas Arden, F. Albert Bosanquet, Lt.-Col. Oswald B. Feilden, Miss C. Godson, Otto Goldschmidt, Charles Haycock, Reginald R. Lempriere. Henry Nixon, T. M. Shadwell.

One Guinea Members Admitted.—Miss M. A. Adams, Mrs. Cockburn, Miss E. Haines, H. Hollingworth, J. Huish, H. Leah, W. H. Maturin, Miss Moorsom, Miss E. M. Piper, Col. T. H. Sale, J. Smith, Dr. Tulk, Mrs. Tulk.

Mr. S. Jennings read a paper on the Cyclamen, which will be found in another part of the Society's Journal.

After some remarks by G. F. Wilson, Esq., F.R.S., and Colonel R. Trevor Clarke, the Meeting adjourned.

SCIENTIFIC COMMITTEE.

Sir JOSEPH D. HOOKER, C.B., President R.S., in the Chair.

Crocus.—Some very interesting forms of *Crocus* were exhibited by the Rev. Harpur Crewe, Colonel Trevor Clarke, and Mr. H. J. Elwes, amongst which were some apparently quite new. One, a very dark *Crocus* with slender leaves, was certainly a novelty, and was referred to Kew for further investigation. Mr. Crewe showed a large and very beautiful *Crocus* allied to *C. Imperati* from the mountains near Ravello, where it flowers a month or five weeks later than *C. Imperati*, from which it differs in its much larger size, the deeper mauve of the inner side of the petals, and the stripes on the outer side, which in *C. Imperati* are broad and feathered, and reach nearly the whole length of the petal, but in the Ravello form are narrow and scarcely feathered at all, and only exist at the base of the petal. It was found by his friend, Mr. Neville Reid, of Amalfi, who is of opinion that it is a distinct species, Colonel Trevor Clarke remarked that *C. insularis* flowered a month

later than *C. Imperati*, from which it was very distinct; but that between *C. Imperati* and *C. suaveolens* there was but little distinction, except by the scent. He showed a new seedling which had appeared amongst a lot of *C. biflorus*—a very unusual form; it was certainly not the Barton Park *biflorus*, which was a very old one, nor the *Weldeni* form of the same, but appeared to be intermediate.

Hybrid Peas.—Colonel Clarke next exhibited some crossed Peas; there was the old-fashioned Woodford Marrow and Knight's Dwarf Marrowfat. He had crossed the two, and now showed the hybrid, together with the parent, so that the difference could be easily observed.

Hybrid Elisena.—The Colonel next reminded the Committee how he had raised a mule plant by crossing *Elisena* with *Ismene*; he now showed a great curiosity. The mule had proved fertile, it has produced a perfect seed, and he now exhibited the bulb produced from it, which he handed over to Sir Joseph Hooker for Kew. The blossom had been set by its own pollen.

Narcissus (Corbularia) monophyllus.—Mr. Elwes exhibited a potful of this Algerian Narcissus in full bloom, not less than 50 to 60 flowers being out or in bud at one time. It had been sent to him by Mr. Hammond, of St. Albans Court, Wingham, Kent, and was a most remarkable instance of successful cultivation, as this plant had always been found very difficult to manage. Mr. Hammond informed him that he had brought the bulbs ten years previously from the Atlas, where they grew under the Cedars, at an elevation of 3000 to 4000 feet, in a reddish gritty soil. They had received no special culture, being kept in pots in a cold frame, and dried off in summer, being repotted every two or three years. This plant has not been found to succeed out of doors, where it gets injured by frost and slugs, and had never flowered with Mr. Elwes planted out in a frame. It appears therefore that pot cultivation is necessary for the plant, though as a rule not advantageous to hardy or half-hardy bulbs.

Himalayan Primroses.—Attention was next directed by Mr. Elwes to four forms of Himalayan Primulas—*P. erosa*, *P. denticulata*, *P. purpurea*, and a supposed hybrid raised by Mr. Anderson Henry between the two latter, which was perfectly glabrous, and free from the yellow mealy deposit which was characteristic of the two forms. *P. erosa*, though very nearly related, and perhaps from a botanical point of view, was not distinct. He thought it was a well marked variety, easily distinguished by the mealy down which

covered its floral items being white instead of yellow. All these plants seemed hardy in England, but owing to their very early flowering habit, were best treated as pot plants, or protected by a hand light in spring.

Snowdrops.—Mr. Elwes also showed flowers of *Galanthus Elwesii* (Hooker fil), to show the characters by which it differed from *Galanthus imperati* and other forms. He thought there could be no doubt that it was a perfectly distinct species.

Varieties of Hornbeam, Hazel, Beech.—Dr. Hogg exhibited two forms of each of these. He had been unable to trace any mention of this interesting fact being noticed either by botanists or in any book on forestry, but practical men who are accustomed to work in the woods say that they find a very marked distinction between them. There was a *white* and a *black* Hazel, a *white* and a *black* Birch, a *white* and a *black* Hornbeam, distinguished by the colour of the bark. There was considerable difference between the two kinds of each of these, not only in the colour of the bark, but also in the different character of the wood. All three are very much used for withes for tying up faggots, but the wood of the black varieties is not nearly so tough as the white, and the woodmen never use the black Hornbeam for this purpose, as it is quite brittle and useless. The white Hornbeam is as tough as a willow. The difference in character was clearly constitutional; the twigs exhibited were all cut the same day. It is to be hoped that these different forms will be more closely examined when they come into flower. The black Hazel is much rarer than the white. In the Weald of Sussex the Hornbeam is called the Beech, and the black variety the Husbeech.

Galls on Willow.—Dr. Hogg also showed some Willow twigs upon which were Galls, which were pronounced to be those of *Cecidomyia*, containing *Dipterous* larvæ.

Seedling Primrose.—Mr. G. F. Wilson showed a new seedling Primrose which he had raised, the colour of which was a rich Tyrean purple. There were several of the principal Primrose growers at the Floral Committee, who all said it was of a perfectly new colour. The name "Scott Wilson" was given to it.

Fuchsias, &c.—Mr. Green, gardener to Sir George Macleay, introduced by Mr. Elwes, showed two species of Fuchsia which had often been confounded—*F. splendens* and *F. cordifolia*. The latter is exceedingly rare; Sir J. Hooker remarked that they had not got it at Kew. There are no Fuchsias found north of the

Tropics in Mexico. Flowers of *Hexacentris coccinea* and *Salvia elegans* were also shown.

Diseased Yew.—Dr. M. T. Masters, on the part of the Hon. and Rev. J. T. Boscawen, submitted a twig of Yew of which some of the leaves were affected with a Fungus. Dr. Cook described it as a species of *Sphaerella*, giving them quite an ornamental appearance.

Lycoperdon giganteum.—Dr. Masters exhibited, on the part of Miss Ormerod, specimens of this Fungus, with the following letter:—

“Miss E. Ormerod begs to forward two unusually large specimens of *Lycoperdon giganteum*, Smith, found yesterday beneath the floor in Spring Grove Church. The spot was apparently in good order, and the specimens are said to have been growing only on ‘dry rubbish,’ but they are of such large size they may possibly be of interest. The largest of the two, much resembling a mass of half-baked dough fallen into a flattened oval form from its own weight, is 3 feet 5 inches in circumference, 3 feet 3 inches longest vertical ditto, 3 feet shortest ditto; 10 inches in height.”

Revolving Movement in the Leading Shoot of Abies Nordmanniana.—Dr. Masters showed a diagram indicating the revolution of the leading shoot of this plant as observed in July last during the period of growth from hour to hour during twelve hours. The shoot made a swoop round, keeping its point to the east from 9 a.m. till 3 p.m., from which time till 7 p.m. it was directed vertically at 8 p.m. the tip of the shoot pointed to the north, and at 9 p.m. to the north-west.

Growth of Flower-stem of Tritoma.—Dr. Masters showed a diagram representing the rate and direction of growth in the flower-stem of this plant. When originally measured the total length from the ground to the base of the inflorescence was $5\frac{1}{8}$ inches. This space was marked out with compass points into spaces one-eighth of an inch apart, there being forty-two in all. When growth in length had apparently ceased for some days the intervals between the marks were measured, and showed extraordinary variations. In some cases little or no growth had taken place, the marks remaining one-eighth of an inch apart; in others great growth had taken place, in one case to as much as $1\frac{3}{8}$ inch. On the whole, the greatest growth was in the upper one-third of the stem. The mean growth of the entire number of species was between five-eighths and six-eighths of an inch.

Fungoid Diseases of the Vine.—Dr. M. C. Cooke read the second part of his valuable paper on this subject, which is printed *in extenso* in the present number of the Society's Journal.

FLORAL COMMITTEE.

Medals awarded.—Silver-gilt Banksian Medal to Messrs. J. Veitch & Sons, for groups of Orchids and Cyclamen. Silver Banksian Medals, to Mr. B. S. Williams, for group of plants; and to Messrs. Osborn & Sons, for group of plants. Bronze Medals, to Mr. James, gardener to W. F. Watson, Esq., for group of Cinerarias, which were highly commended; to Messrs. Wm. Paul & Son, for cut blooms of Camellia; to Mr. C. Edmonds, for group of Cyclamen; and to Messrs. J. Standish & Co., for group of plants. First-Class Certificates were awarded to M. B. S. Williams, for *Primula sinensis fimbriata coccinea*; to Mr. W. Bull, for *Hæmanthus rupestris*; to Mr. H. B. Smith, Ealing, for *Cyclamen* “*Rosy Morn*”; to Mr. James, gardener to W. F. Watson, Esq., Isleworth, for *Cyclamen* “*White Beauty*”; and to Mr. Edmonds, of Hayes Nursery, for *Cyclamen persicum roseum grandiflorum*. Botanical Commendation awarded to Messrs. J. Veitch & Sons, for *Aerides vandarum*, and to Messrs. Rollisson & Sons, for *Saccolabium calceolare*. Cultural Commendations awarded to Mr. B. Johnstone, gardener to T. T. Clarke, Esq., Uxbridge, for fine examples of *Daphne indica rubra*; and to W. O. Hammond, Esq., of St. Albans Court, for well-flowered potful of *Narcissus* (*Corbularia monophyllus*). Votes of Thanks awarded to the Hon. Rev. J. T. Boscawen, for plant of *Amaryllis* “*Téméraire*”; to Mr. Wills, for his group of decorative plants and Orchids; to the Duke of Portland, for cut blooms of hardy Azaleas; to Mr. H. B. Smith, Ealing, for group of Cyclamens; and to Mr. Winn, of Wood Street, Birmingham, for *Odontoglossum Alexandrae*, var. *Winnii*.

LIST OF DONORS OF PLANTS, &c., 1877.

Amies, Mr. W. S., 284, Liverpool Road, N. Manure 1 ton.
 Backhouse, Messrs. James & Son, the Nurseries, York. 44 varieties
 herbaceous and alpine plants, vegetable seeds.

- Ballard, Mrs., 48, Addison Road. 1 Cycad, Melon seeds.
- Barr & Sugden, Messrs., 12, King Street, Covent Garden, W.C.
Iris barbata (115 varieties).
- Benary, Ernest, Erfurt, Prussia. Collections of garden annual seeds.
- Bennett, Mr. E., the Nurseries, Rabley. Strawberry runners.
- Bland, Mr. E., the Gardens, Cranbourne Court, Winkfield. Vegetable seeds.
- Bliss & Sons, Messrs. B. K., New York. Herbaceous plants (seeds), 6 varieties Potatos, 11 varieties vegetable seeds.
- Bonsall, Mr. F., the Gardens, Campsount, Doncaster. Vegetable seeds.
- Cannell, Mr. Henry, the Nurseries, Swanley Junction. Pelargoniums zonal (2 varieties).
- Carter & Co., Messrs. J., 237 and 238, High Holborn, W.C. Vegetable seeds (114 varieties).
- Churchill, Lord Alfred S., 16, Rutland Gate, S.W. Greenhouse plants, Clematis, bulbs, herbaceous plants.
- Clarke, Col. R. T., Welton Place, Daventry. Melon seeds, plants.
- Clay, Mr., 174, High Street, Homerton, E. 1 bag manure.
- Cocker, Messrs. J., & Sons, Sunnypark Nurseries, Aberdeen. Pansies.
- Culverwell, Mr. W., the Gardens, Thorpe Perrow. Vegetable seeds.
- Cutbush & Sons, Messrs., the Nurseries, Highgate. Epacris (16 varieties).
- Dancer, Mr. F. N., Little Sutton, Turnham Green. 200 Clove Carnations.
- Daniels Bros., Messrs., Norwich. Flower and vegetable seeds (5 varieties).
- Dean, Mr. R. Ranelagh Road, Ealing, W. Violas, flower and vegetable seeds.
- Denning, Mr. W., the Gardens, Londesborough Lodge, Surrey. Strawberry runners.
- Denny, Dr., High Street, Stoke Newington. Pelargoniums zonal (14 varieties).
- Dickson, Messrs. F. & A., 106, Eastgate Street, Chester. Vegetable seeds.
- Dippe, Bros., Quedlinburg, Germany. Flower seeds and garden annuals (160 varieties).

- Dodds, Mr. F., the Gardens, Herringswell House, Suffolk. Pelargoniums zonal (4 varieties).
- Dyer, Mr. W. T., Royal Gardens, Kew. Melon [seeds (6 varieties from Kashgaria).
- Farley, Mr. W., the Valentines, Ilford, E. Vegetable seeds.
- Ellam, Mr. J., the Gardens, Bodorgan, Anglesea. Vegetable seeds.
- Elwes, Mr. H. J., Preston, Cirencester. 230 packets Himalayan seeds, 14 varieties bulbs, Orchids; Australian Pines (seeds), Palm seeds, American shrubs (15 varieties).
- Farquhar, Mr. R., the Gardens, Fyvie Castle, N.B. Herbaceous plants (seeds), 6 varieties vegetable seeds.
- Fraser & Son, Messrs. John, the Nurseries, Lea Bridge. Epacris (37 varieties), Verbenas (18 varieties).
- Gray, Mr. John, Eglington Castle Gardens, Ayrshire. Vegetable seeds.
- Green & Sons, Messrs. Thomas, Leeds. 1 verge-cutter.
- Gregory, Mr. J. H., seed-grower, Marble Head, U.S. America. Potatos (5 varieties).
- Gibson, Mr. John, Superintendent, Hyde Park. Cannas (12 sorts).
- Guisan, Mr. J., officer S.S. *Menzalet*. Fern (*Drynaria quercifolia*) (16 plants).
- Hardy, Mr. H. J., Stour Valley, Seed Grounds, Bures, Essex. Pelargonium zonal (6 varieties), garden annuals (3 varieties), vegetable seeds.
- Harrison & Sons, Messrs., seed merchant, Leicester. Vegetable seeds (6 varieties) *Mimulus moschatus Harrisoni* (6 plants).
- Haughton, Mr. W., E.I.U.S. Club, 14, St. James's Square, S.W. Radish seeds (3 varieties).
- Hayes, Messrs. J. & J., florists, Edmonton. Double Primulas (48), flower seeds.
- Herbst, Mr. H., Kew Nursery, Richmond. Palms, shrubs and Conifer, double Primulas, Ferns.
- Hooker, Sir J. D., the Royal Gardens, Kew. Seed of Cabbage from Yezd, Persia.
- Hope, Miss J., Wardie Lodge, near Edinburgh. Pelargoniums Cape (13 varieties), herbaceous and alpine plants (21 varieties).
- Howe, Mr. G., Daventry. Vegetable seeds.
- Hooper & Co., Messrs., Covent Garden. Vegetable seeds.

- Jackson & Son, Messrs. T., the Nurseries, Kingston. Epacris (8 varieties).
- Kew Royal Gardens. Herbaceous and alpine plants (200 varieties), Cape Pelargoniums (50 varieties).
- Laue & Son, Messrs. J. E., Great Berkhamstead. Celery, "Seymour's White" (seeds).
- Lawson Seed Company, Edinburgh. Strawberry plants, "Duke of Edinburgh" (12 plants).
- Lee, Messrs. Charles & William, Hammersmith, W. Epacris (20 varieties), Potatos.
- Leichtlin, Max, Baden-Baden. *Canna iridifolia hybrida*, two plants.
- Lemoine, Mons. V., 67, Rue de l'Etang, Nancy. Pelargoniums zonal, double, ivy-leaved (30 varieties).
- Little & Ballantyne, Messrs., Carlisle. Alpine and herbaceous plants (35 varieties).
- Low & Co., Messrs. Hugh, the Nurseries, Clapton. Epacris (12 varieties).
- McLean, Mr. M., the Gardens, Linton Park. Stocks, East Lothian (2 varieties).
- McNab, Mr. A. K., Botanic Gardens, Edinburgh. 33 herbaceous and alpine plants.
- Maw, Mr. G., Benthall Hall, Broseley, Salop. 180 herbaceous and alpine plants.
- Miles, Mr. F., Bingham, Notts. Pelargoniums zonal.
- Minier & Co., 60, Strand, W.C. Vegetable seeds (54 varieties).
- Murray, Mr. A., 67, Bedford Gardens, S.W. Australian seeds.
- Nutting & Sons, Messrs. W. J., 60, Barbican, E.C. Vegetable seeds (51 varieties).
- Osborn & Sons, Messrs., the Nurseries, Fulham: Epacris (4 varieties).
- Parker, Mr. R., the Nurseries, Tooting. Delphiniums (24 varieties), Pæonies (27 varieties), Potentillas (17 varieties), Pyrethrums (36 varieties), Ivies (4 varieties), Campanulas, spring flowering plants.
- Paul & Son, Messrs. William, Waltham Cross. Red Currants (6 plants).
- Perry, Mr. P. J., Banbury. Vegetable seed.
- Pottle, Mr. J., the Gardens, Sudborne Hall, Wickham Market. Vegetable seeds.
- Rogers, Mr. A., Battersea Park. Cannas (43 varieties).
- Rollison & Sons, Messrs. William. Epacris (17 varieties).

- Ross, Mr. C., the Gardens, Welford Park, Newbury. Potato, "Criterion."
- Smith, Messrs. F. A., Dulwich. Collection of Balsam seed.
- Smith & Sons, Messrs. W., seedsmen, Aberdeen, N.B. Potatos (6 varieties).
- Strickland, Sir C. W., Hildenley, Malton. *Hedychium Gardnerianum* (30 plants), *Panicum sulcatum* (40 plants).
- Stuart & Mein, Messrs., nurserymen, Kelso, N.B. Vegetable and flower seeds (20 varieties).
- Taylor, Mr. J., the Gardens, Hardwick Grange, near Shrewsbury. Vegetable seeds.
- Taylor, Mr. Thomas, Market Place, Hinckley. Vegetable seeds.
- Thomson, Mr. George, superintendent, Crystal Palace. *Primula Japonica* (100 plants), Ferns.
- Thorpe, Mr. R. J., Railway Tavern, Feltham. Vegetable seeds.
- Turner, Mr. C., the Royal Nurseries, Slough. Vegetable seeds.
- Tyerman, Mr. J., Penlee, Tregoney, Cornwall. Vegetable seeds.
- Veitch & Sons, Messrs. J., Chelsea. Gloxinias (55 varieties), Begonias (6 varieties), Epacris (4 varieties), Pelargoniums (zonal) (13 varieties), new plants (19 varieties) vegetable seeds (66 varieties).
- Vilmorin et Cie, Messrs., 4, Quai de la Megisserie, Paris. Vegetable seeds (115 varieties), garden annuals (160 varieties).
- Waite, Burnell, Huggins, & Co, Messrs., 79, Southwark Street, S.E. 2 lawn mowing machines.
- Wheeler & Son, Messrs. J. C., Gloucester. Vegetable seeds (20 varieties), flower seeds (13 varieties).
- White, Mr. John, 9, Ladymead, Bath. Potatos (2 varieties).
- Williams, Mr. B. S., the Nurseries, Upper Holloway, N. Epacris (12 varieties), Crotons (7 varieties), Palms (3 varieties), fruit trees (2 varieties).
- Wills, Mr. John, Royal Exotic Nursery, Onslow Crescent, South Kensington. Begonias (10 varieties), Dracænas (6 varieties), Gloxinias (6 varieties), Ferns (2 varieties).
- Wilson, Mr. G. F., Heatherbank, Weybridge. 31 herbaceous and alpine plants.

NEW FRUITS AND VEGETABLES CERTIFICATED BY THE FRUIT COMMITTEE. 1877.

[F.C., First-class Certificate.]

- Apple, Loddington Seedling (Stone's), Lewis Killick, October 2. F.C.
 Brocoli, Veitch's Self-Protecting, J. Veitch & Sons, December 4th. F.C.
 Melon, "Cream Pine," J. Carter & Co., October 10. F.C.
 „ "Exquisite," C. Tyler, November 6. F.C.
 Nectarine, "Lord Napier," T. Rivers & Son, August 28. F.C.
 Pine Apple, Lord Carrington's, G. T. Miles, January 17. F.C.
 Sea-Kale, Lillywhite, Stuart & Mein, April 4th. F.C.
 „ „ H. F. Jones, April 4th. F.C.
 Tomato, Little Gem, Bliss & Sons, August 28. F.C.
 „ Criterion (New Improved), J. Vick, August 28. F.C.
 „ Large Red, Vilmorin et Cie., August 28. F.C.
 „ Trophy, Carter & Co., August 28. F.C.
 „ „ Veitch & Sons, August 28. F.C.
 „ „ Wheeler & Sons, August 28. F.C.
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NEW FLOWERS CERTIFICATED BY THE FLORAL COM- MITTEE AT THE CHISWICK TRIALS. 1877.

[F.C., First-class Certificate.]

- Begonia, Mrs. Barron, R.H.S., July 25. F.C.
 Dianthus chinensis flore-pleno, Benary, August 27. F.C.
 „ Heddewigii, Benary, August 27. F.C.
 „ „ hybridus atropurpureus, Benary, August 27. F.C.
 „ „ „ flore-pleno, Benary, August 27. F.C.
 „ „ laciniatus, Benary, August 27. F.C.
 „ „ plenissimus splendens, Haage & Schmidt, August 27. F.C.
 „ Imperialis flore-pleno, Benary, August 27. F.C.
 Fuchsia, Lord Beaconsfield, Laing, July 25. F. C.

Iberis coronata hybrida nana alba, Vilmorin, July 25. F.C.
 „ „ „ „ *rosea*, Vilmorin, July 25. F.C.

Pelargoniums.

As Bedding Varieties.

Athos, Pearson, July 25. F.C.
 Beauty of Surrey, George, July 25. F.C.
 Charles Smith, Pearson, August 27. F.C.
 Excelsior, Denny, August 27. F.C.
 John Fraser, Cocker, July 25. F.C.
 Lais, Denny, August 27. F.C.
 Lord Giffard, George, August 27. F.C.
 Mabel Eden, Pearson, August 27. F.C.
 Mrs. Holden, Pearson, August 27. F.C.
 Mrs. Huish, Pearson, August 27. F.C.
 Mrs. J. George, George, July, 25. F.C.
 Mrs. Lancaster, Pearson, August 27. F.C.
 Portia, Denny, August 27. F.C.
 Rev. A. Atkinson, Pearson, July 25. F.C.

Grown in Pots under Glass.

Blanche Gordon, Pearson, July 25. F.C.
 Lady Eva Campbell, Pearson, August 27. F.C.
 Lord Mayo, George, July 25. F.C.
 Louis, Pearson, August 27. F.C.
 Louisa, Pearson, July 25. F.C.
 Lustrous, George, August 27. F.C.
 Miss Wakefield, Pearson, August 27. F.C.
 Mrs. Pearson, Pearson, August 27. F.C.
 Rebecca, Pearson, July 25. F.C.

Pelargoniums double-flowered.

Depute Aneélon, Lemoine, August 27. F.C.
 Le Nord Est, Lemoine, August 27. F.C.
 Verbena Carl Sieglig, Fraser, July 25. F.C.
 Viola Golden Prince, Fromow, July 25. F.C.
 „ Holyrood, Dickson, July 25. F.C.
 „ Vestal, Dean, July 25. F.C.

NEW PLANTS, &C., CERTIFICATED BY THE FLORAL COMMITTEE, 1877.

[F.C., First-class Certificate; S.C., Second-class Certificate; H.C., Highly Commended; B.C., Botanical Commendation.]

- Abutilon Lemoinei*, R.H.S., August 21. F.C.
Adiantum Williamsii, Williams, May 2. F.C.
Aërides crassifolium, Veitch, July 3. F.C.
Agave schidigera princeps, Kellock, May 2. F.C.
Alocasia Thibautiana, Veitch, July 3. F.C.
Alsophila pycnocarpa, Veitch, April 4. F.C.
Amaryllis Princess of Teck, Veitch, February 14. F.C.
Anthurium Brownii, Veitch, May 2. F.C.
 ,, *Scherzerianum Wardii*, Veitch, April 4. F.C.
 ,, *Veitchii*, Veitch, June 19. F.C.
 ,, *Warocquianum*, Veitch, June 19. F.C.
Aquilegia hybrida californica, Douglas, June 5. F.C.
 ,, *hybrida cœrulea*, Douglas, June 5. F.C.
Aralia filicifolia, Williams, May 2. F.C.
Auricula (alpine) Florence, Douglas, May 2. F.C.
 ,, ,, John Ball, Turner, May 2. F.C.
 ,, ,, Prince, Douglas, May 2. F.C.
 ,, (show) Sarah, Turner, May 2. F.C.
Azalea (mollis) Couleur de Paille, Veitch, May 15. F.C.
 ,, (amœna) Mrs. Carmichael (as a decorative plant) Williams,
 March 7. F.C.
Balsams (for strain) Reeves, July 17. H.C.
Begonia Empress of India, Perkins, August 21. F.C.
 ,, *Monarch*, Veitch, July 17. F.C.
 ,, *Mrs. Charles Scorer*, Veitch, July 17. F.C.
 ,, *Oriflamme*, Laing, June 19. F.C.
 ,, *Queen of Whites*, Veitch, August 21. F.C.
 ,, (double) *Gloire de Nancy*, Laing, June 5. F.C.
Calanthe vestita oculata rubra var. *gigantea*, Lawrence, Feb. 14.
 F.C.
Carnation (Clove) Mrs. Matthews, Turner, July 17. F.C.
 ,, ,, Tom Thumb scarlet, Veitch, June 19. F.C.
 ,, (Tree) *A Alegatière*, Turner, December 4. F.C.
 ,, ,, *Guelder Rose*, Turner, March 7. F.C.
 ,, ,, *Osman Pacha*, Turner, October 2. F.C.
 ,, ,, *Rose Perfection*, Turner, March 7. F.C.

- Catasetum scurra*, Lawrence, February 14. B.C.
Cattleya Skinnerii alba, Veitch, June 5. F.C.
Chrysanthemum (Japanese) Fulton, Jackson; Moorman, Dec. 4. F.C.
 „ (show) *Golden Empress of India*, Henderson, December 4. F.C.
Cibotium pruriatum, Bull, December 4. F.C.
Cineraria Mary, James, March 7. F.C.
 „ *Mrs. Beck*, James, May 2. F.C.
 „ *Thomas Winter*, James, March 7. F.C.
Cinerarias (for strain) James, March 7. H.C.
Clematis Aurora, Noble, April 4. F.C.
 „ *Madame Grange*, R. Smith, June 19. F.C.
Cœlogyne corrugata, Green, August 21. S.C.
Coleus multicolor, Veitch, May 2. F.C.
Colorado Menziesii, A. Waterer, August 21. F.C.
Croton Earl of Derby, Veitch, March 21. F.C.
 „ *Macarthurii*, Veitch, March 21. F.C.
 „ *Mortii*, Bull, February 14. F.C.
 „ *picturatus*, Bull, December 4. F.C.
 „ *Prince of Wales*, Williams, June 19. F.C.
 „ *Queen Victoria*, Williams, July 17. F.C.
Cycas media latissima, Bull, February 14. F.C.
Cyclamen (persicum) Brilliant, Clarke, April 4. F.C.
 „ „ *compactum magnificum*, Edmonds, Feb. 14. F.C.
 „ „ *Ruby*, Little, March 21. F.C.
Cypripedium albo-purpureum, Veitch, July 3. F.C.
 „ *Druryii*, Veitch, April 4. B.C.
 „ *occidentale*, Elwes, May 15. F.C.
Dahlia Bessie Ford, Keynes, September 4. F.C.
 „ *Charles Wyatt*, Keynes, September 4. F.C.
 „ *Henry Bond*, Keynes, September 4. F.C.
 „ *James Willing*, Rawlings, October 2. F.C.
 „ *Louisa Neate*, Keynes, September 4. F.C.
 „ *Mrs. Shirley Hibberd*, Rawlings, October 2. F.C.
 „ *The Countess*, Keynes, September 4. F.C.
Dendrobium, barbatulum grandiflorum, Lawrence, April 4. F.C.
 „ *crassinode Barberianum*, Lawrence, March 7. F.C.
 „ *Lindleyanum*, Lawrence, January 17. S.C.
 „ *sculptum*, Lawrence, April 4. F.C.
 „ *suavissimum*, Williams, August 7. F.C.

- Dennstædtia davallioides* Youngii, Veitch, March 7. F.C.
Dicksonia Berteroana, Veitch, November 6. F.C.
Dracæna Bauseii, Williams, August 7. F.C.
 „ Mrs. Bause, Wills, May 2. F.C.
 „ Robinsoniana, Veitch, May 5. F.C.
 „ terminalis alba, Wills, March 7. F.C.
Echinocactus grandicornis, Croucher, July 17. F.C.
Eschscholtzia flore-pleno, Carter, July 3. F.C.
 „ Mandarin, Carter, July 3. F.C.
Eulophia guineensis, Lawrence, August 7. F.C.
Eurycles australasica, Veitch, March 7. F.C.
Fritillaria sp. ex. California, Elwes, April 18. B.C.
Geonoma princeps, Bull, December 4. F.C.
Gladiolus, Baroness Burdett-Coutts, Kelway, August 21. F.C.
 „ Charles Noble, Kelway, August 21. F.C.
 „ Cymbeline, Kelway, August 21. F.C.
 „ Prince George, Kelway, August 21. F.C.
 „ Rhamnes, Kelway, October 2. F.C.
 „ The Odalisque, Kelway, August 21. F.C.
Gloxinia Paragon, Kinghorn, June 5. F.C.
Gymnogramma Muelleii, Veitch, June 19. S.C.
Houlletia Lowiana, Lawrence, May 15. B.C.
Hydrangea, Thomas Hogg, Veitch, July 17. F.C.
Iris Kæmpferi, var. alba grandissima, Barr, July 3. F.C.
 „ „ Mrs. Barr, Barr, July 3. F.C.
 „ „ Robert Parker, Barr, July 3. F.C.
 „ *Xiphium junceum*, Elwes, July 3. B.C.
Ixora formosa, Fraser, August 21. F.C.
Juniperus virginianus albo spicatus, Holmes, June 19. F.C.
Lælia Dayana, Lawrence, January 17. F.C.
Lathyrus latifolius splendens, Parker, July 17. F.C.
Lilium croceum var. Chaixii, Maw, July 3. F.C.
 „ elegans var. Alice Wilson, Wilson, July 19. F.C.
 „ „ Mawii, Maw, July 3. F.C.
Lomaria discolor bipinnatifida, Veitch, May 2. F.C.
Masdevallia macrura, Denning, February 14. B.C.
 „ triaristella, Veitch, July 3. B.C.
 „ Wallisii (Chimæra), Veitch, February 14. F.C.
Narcissus calathinus, Blanchard, April 4. B.C.
 „ rupicola, Elwes, April 4. B.C.
Nepenthes Courtii, Veitch, October, 2. F.C.

- Nepenthes hybrida maculata elongata*, Veitch, October 2. F.C.
 „ *rubro maculata*, Veitch, October 2. F.C.
Nephrolepis Duffii, Veitch, April 4. F.C.
Odontoglossum Alexandræ roseum, Ollerhead, June 5. F.C.
 „ *Cervantesii* var. *decorum*, Lawrence, February 14.
 F.C.
 „ *coronarium miniatum*, Mill, July 17. F.C.
Oncidium crispum marginatum grandiflorum, Lawrence, May 15.
 F.C.
 „ *metallicum*, Lawrence, May 15. B.C.
 „ *prætextum*, Veitch, August 21. F.C.
Osmunda palustris, Veitch, March 7. F.C.
Pavonia Wiotii, Veitch, June 19. B.C.
Pelargonium (decorative), Dr. Masters, Williams, June 19. F.C.
 „ „ *Duchess of Bedford*, Beckwith, April 18.
 F.C.
 „ „ *Empress of India*, Sweet, May 2. F.C.
 „ (zonal) *New Life*, Cannell, September 4. F.C.
 „ „ *Venus*, Turner, June 5. F.C.
 „ (double) *Lafayette*, Lemoine, August 21. F.C.
 „ „ *Littre*, Lemoine, August 21. F.C.
 „ (echinatum), *Spotted Gem*, Cannell, August 7. F.C.
 „ (fancy), *Mr. King*, Turner, June 5. F.C.
 „ „ *Mrs. Pope*, Turner, June 19. F.C.
 „ (show), *Eloquence*, Turner, June 5. F.C.
 „ „ *Fortitude*, Foster, June 19. F.C.
 „ „ *Invincible*, Foster, June 19. F.C.
 „ „ *Virgin Queen*, Turner, June 5. F.C.
 „ (zonal) *Dr. J. Denny*, Cannell, September 4. H.C.
 „ „ *Tom Bowling*, Burley, June 5. F.C.
 „ „ *White Vesuvius*, Cannell, December 4. F.C.
Phaius Dodgsoni, Williams, August 21. F.C.
Poinsettia pulcherrima plenissima, Veitch, March 21. F.C.
Polyanthus, Duke of Wellington, G. Smith, April 18. F.C.
Primrose, Brilliant, Dean, April 4. F.C.
Primula capitata, R.H.S., November, 6. F.C.
 „ *cortusoides* var. *cœrulea*, Dean, April 18. F.C.
 „ „ *maxima*, Dean, April 18. F.C.
 „ „ *purpurea*, Dean, April 18. F.C.

(*To be continued.*)

- Primula sinensis* double, Marchioness of Exeter, Gilbert, March 21. F.C.
- „ „ „ Mrs. Barron, Gilbert, October 2. F.C.
- „ „ „ Princess, Gilbert, October 2. F.C.
- „ „ „ White Lady, Gilbert, October 2. F.C.
- „ „ *veris purpurea*, Dean, March 21. F.C.
- „ „ „ *robusta alba*, Dean, April 18. F.C.
- „ „ „ sp. (Sikhim) Henry, August 21. B.C.
- Pultenæa rosea*, Rollisson, April 4. F.C.
- Pyrus japonica alba*, Veitch, February 14. F.C.
- Rhododendron*, Countess of Derby, Veitch, July 3. F.C.
- „ *Taylori*, Veitch, March 7. F.C.
- Rose* (H.P.), Duchesse de Vallambrosa, Bennett, March 21. F.C.
- „ *Emily Laxton*, Paul & Son, May 2. F.C.
- „ *Marchioness of Exeter*, Paul & Son, July 3. F.C.
- „ *Marquis of Salisbury*, Paul & Son, August 7. F.C.
- „ *May Quennell*, William Paul & Son, July 3. F.C.
- Sarcophilus Fitzgeraldii*, Veitch, April 4. B.C.
- Sarracenia Chelsoni*, Veitch, November, 6. F.C.
- Schlimia trifida*, Lawrence, January 17. B.C.
- Spathoglottis Lobbii*, Lawrence, February 14. B.C.
- Streptocarpus Greenii* var. *delicata*, Green, August 21. F.C.
- Thrinax gracillima*, Williams, June 19. F.C.
- Tillandsia* sp. (Jamaica), Green, March 21. B.C.
- Torenia Fournieri*, R.H.S., August 21. F.C.
- Tropæolum* (climbing) *Perfection*, Dean, December 4. F.C.
- Tulipa Greigii*, Elwes, April 18. F.C.
- Vanda Parishii*, Veitch, July 3. S.C.
- Zamia Lindenii*, Bull, May 2. F.C.
- „ *obliqua*, Bull, May 2. F.C.
- „ *Roezlii*, Bull, May 2. F.C.
- Zygopetalum Clayii*, Clay, May 2. S.C.

MARCH 5, 1878.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Elections.—Right Hon. Acton S. Ayrton, Lady Beauchamp, Hon. Isabel Calthorpe, Harold L. Coffin, Lt.-Gen. Rudolph de Salis, C.B., H. G. Guy Elliott, Bartle G. Goldsmid, Philip Capel Hanbury, James Henry, Mrs. Huggins, William Gerard Lysley, Lieut.-Gen. Sir Thomas McMahon, Mrs. Nangle, Mrs. Simpson, Sir Julius Vogel, K.C.M.G., Rev. B. Winthrop.

One Guinea Members Admitted.—Miss Florence Williams, J. Rose.

The Awards of the Floral Committee were announced, and remarks were made by the Assistant Secretary, explanatory of some of the most interesting plants exhibited.

Colonel R. Trevor Clarke read a paper on the Cultivation of the Fig as a Standard in the open air. This paper is published in the Journal of the Society.

The Meeting adjourned.

SCIENTIFIC COMMITTEE.

SIR JOSEPH D. HOOKER, K.C.S.I., C.B., Pres. R.S., in the Chair.

Phyllody of Calyx.—Dr. M. C. Cooke exhibited a remarkable specimen of the common Primrose, which had been found growing wild in the neighbourhood of Highgate, in which the calyx was completely leafy. It was found growing in a clay soil, and Sir Joseph Hooker remarked that whenever such specimens were discovered they were almost invariably found in a clay soil. The plant had been sent to Dr. Cooke by Mr. Coomber, of Highgate.

Tulipa Gesneriana, var. Schrenkii.—Mr. Elwes showed flowers of this very early blooming species from Russia. The bulbs were not planted till November, so that it may be considered very much the earliest flowering of all Tulips. Also *T. stellata*, from the

North-West Himalayas. In a house this Tulip would flower as early as Christmas.

Chionodoxa Forbesii, another curiosity showed by Mr. Elwes—a Scilla-like plant from Asia Minor, with flowers six-parted, the segments linear lanceolate, spreading, and of a sky-blue colour. A most interesting plant, seen now for the first time in this country; it would probably be in finer bloom next year. This plant comes from the mountains above Smyrna.

Erythronium grandiflorum.—A species with much longer petals than the yellow species from California. It also is a native of America, but from a district a good deal further north.

Helleborus Caucasicus, var. *guttatus*.—The very finest of all the garden Hellebores. There are disputes as to whether it is a good species or only a variety. It is a very handsome plant, stands up well, and of very good habit.

Calceolaria Pavonii.—An interesting plant, concerning which the Rev. George Henslow remarked that it was a fact not generally known that the stamens had the same lever-like oscillatory movement as in the well-known case of *Salvia*.

Lilium Parryi.—Mr. Elwes showed a drawing of this new Lily, which is a native of California, and has not yet been introduced into this country though in cultivation in America. It apparently belongs to the *Washingtonia* group. There was so great a distinction in the structure and mode of growth of American and European Lilies respectively that the mere inspection of the bulbs was quite sufficient to determine whether a Lily bulb came from America or not.

Malformed Horse Chestnut.—Dr. Masters showed, on the part of J. Prior, Esq., a shoot of Horse Chestnut, in which the base of the leaf-stalk had contracted an adhesion to the stem and was still living, the upper free portion being withered by frost.

Subterranean Buds on Roots of Savoy.—Dr. Hogg showed roots of Savoy with subterranean buds, as in the specimen of Brussels Sprout submitted to the Committee some years since by Mr. W. W. Saunders.

Diseased Bulbs, &c.—Dr. Masters read the following letter addressed to him, and exhibited specimens of the diseased plants forwarded by Mr. Atkins:—

“It is not the first time I have suffered in like manner, but never to the extent of the present. I send specimens of *Cyclamens*, *Iris reticulata*, *Crocus*, and some others. They are all

attacked in like manner. Until within the last two or three weeks all were looking healthy and well, but just when the Cyclamens and *Iris reticulata* (which are now going off by hundreds) commenced flowering they showed the disease. With the former the leaves in many cases appear healthy, but on the slightest touch separate with a portion of the foot-stalks just below the surface of the ground. They very soon flag and decay, whilst the corm and fibres look in most instances white, clear, and healthy; just so with *Iris reticulata*; the upper portion of the leaf appears healthy, but decay takes place at and just below the surface; the bulb and fibres appear sound. Crocuses are much the same, and Tulips and Hyacinths fail in the same manner when three or four inches above ground. The Cyclamens are in cold pits planted out, where I have grown them many years, and some of the plants in the same pits, and close to the diseased ones, are as vigorous and healthy as could be desired. The soil for the Iris bed was renewed this last autumn, consisting of virgin loam (well-decayed turf), sand, or road-grit, with some well-decayed stable manure; in this they have formerly thriven well. In the open garden Cyclamens and *Iris reticulata* appear perfectly vigorous and healthy at present, but Crocuses and Tulips are bad. The progress of the disease is very rapid. I have failed to discover any mycelium or fungus; though on my soil, wherever a bit of stick or wood is decaying, it is very common. Vegetable matter in my Cyclamen pits has been carefully excluded for years. I have applied soot in some cases, but find no benefit.—*James Atkins.*”

At the suggestion of Dr. Masters the specimens were referred for examination and report to a sub-committee, consisting of Rev. M. J. Berkeley, Dr. M. C. Cooke, W. G. Smith, and Dr. Masters.

Diseased Gooseberries.—Dr. Masters showed, on the part of the Rev. H. H. D’Ombrain, shoots of Gooseberries, in which the buds at the lower part of the shoot were dry and shrivelled, those above being healthy and vigorous.

Dr. Hogg remarked that there was no disease in this Gooseberry, but that the blindness was evidently caused by the vigour of the plant having gone off in the young shoot. It is a frequent occurrence in old Gooseberry bushes; the buds are not dead, but there is not sufficient root action to develop them. The remedy was simply to give manure, and so stimulate the roots, when the shoots and buds will develop in due course.

Twin Apples.—Dr. Hogg showed a singular specimen from Mr.

Woolman, of Bedford. The tree which produces these double apples is fifteen or sixteen years old, and has always produced the same peculiarly formed fruit, the entire crop being thus affected.

Abnormal Fungi.—Mr. W. G. Smith exhibited specimens of *Agaricus furfuraceus*, with the exact external aspect of a Morel. The fungi were found under an Oak in a field at Henbury, Bristol, by Mr. Cecil H. S. Perceval. The plants were growing upon the ground and upon chips, and were at first supposed to be small Morels. They, however, grew in company with *Agaricus furfuraceus*, and every intermediate form was found between the normal and abnormal forms of the Agaric. Cases of this nature are sometimes referred to mimicry or protective resemblance, but although the resemblance to a fungus totally different from itself is precise in this instance it is difficult to see what end, if any, could be served by such mimicry.

Composition of Potatos.—Dr. Gilbert made some very interesting remarks on the subject. He said that Mr. Lawes and himself had been for two years experimenting on the effects of different manures on the Potato, and they had obtained a variation in the amount of produce from something over three tons without manure to nearly nine tons with the highest manure. Samples of the different crops had been analysed in the usual way; and a great difference in the composition of the tubers was found. There was a difference of several units per cent. in the amount of dry or solid matter; there was about one and a third time as much mineral matter in some as in others; and there was nearly twice as much nitrogen in some as in others.

It occurred to them that it would be interesting also to examine the tubers somewhat in the way adopted in the case of some root crops, such as sugar beet; that is, to express, and determine the composition of the juice.

It was found that by far the largest proportion of both the mineral matter and the nitrogen of the tuber existed in the clear filtered juice; and there was as striking a variation in the per-centage of these in the juice as in the whole tubers, depending on the character of the manure, and on the amount of crop. It was remarkable, too, that some of the largest crops, which, judging from the withered condition of the tops, must be considered fairly ripe, nevertheless contained a juice relatively very rich in nitrogen.

His special object in referring to these experiments was, how-

ever, to call the attention of the committee to some results which they had obtained with diseased potatoes. Already the Rev. J. H. Jellett* had examined the juice, or rather the extract, of sound potatoes, of the apparently sound part of diseased potatoes, and of the discoloured part of diseased potatoes. He had found a considerable development of sugar in the white part of the diseased tubers. He also determined the amount of nitrogen in the dry matter of similar specimens, and found it to be greater in that of the apparently sound part of diseased potatoes than in that of sound potatoes, and also greater in the diseased part, but not so great as in the apparently sound part.

At Rothamsted they had experimented rather differently. They had determined the nitrogen, and the mineral matter, in the sound whole tubers, and in the diseased whole tubers; in the juice of the sound potatoes, in that of the white part of the diseased potatoes, and in that of the black part of the diseased potatoes. They had also determined them in the washed or exhausted solid matter, or "mark" of the white part, and of the black part, of diseased tubers.

In accordance with Prof. Jellett's results they found a higher per-centage of nitrogen in the dry substance of the diseased than of the sound potatoes; but, calculating the quantity upon the fresh tubers, they did not find evidence that there was an actually greater amount of nitrogen in the diseased potatoes.

The most interesting point in their results was, however, that whilst the juice of the white portion of the diseased potatoes contained, approximately, the same amount of nitrogen as that of corresponding sound potatoes, the juice of the diseased portion contained very much less; in fact, only about one-half or two-thirds as much. On the other hand, the washed or exhausted "mark" of the white portion contained a very small amount of nitrogen, whilst that of the black or diseased portion contained very much more; in some cases four or five or more times as much as the "mark" of the white portion. It was also found that the amount of mineral matter was much higher in the juice of the white than in that of the diseased portion; but much lower in the "mark" of the white than in that of the discoloured portion. It was obvious, from these facts, that the juice had suffered exhaustion of much of both its nitrogen and its mineral matter in the development of

* Proceedings of the Royal Irish Academy, May 22nd, 1876.

the fungus. The sugar, itself the result of diseased action, probably also contributed to the same end.

Insect on Amaryllid.—Mr. Wilson Saunders sent the grub, probably of some Dipterous insect, which had damaged the bulbs of *Amaryllis*. The specimen was referred to Mr. M'Lachlan for examination.

Snowdrops.—Mr. Melville, Dunrobin, sent some additional specimens, including a dwarf form, in which the whole flower was tetramerous, its parts being in fours.

MARCH 19, 1878.

ORDINARY GENERAL MEETING.

COLONEL R. TREVOR CLARKE, Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed, and the Assistant Secretary announced the awards of the Committees.

Elections.—Mrs. Bourne, Mrs. Brooker, Rev. Theophilus Carroll, M.A., William Caudwell, Mrs. Chalmers, Miss Cole, Alexander Courthupe, Mrs. J. H. Dobree, Walter Drummond, Samuel Elliott, jun., Percival Foster, Colonel R. Temple Godman, Matthew Hedley, Mrs. Staveley Hill, Mrs. Seton Karr, Colonel Sir Henry Atwell Lake, K.C.B., James Levesley, Captain R. C. Mayne, R.N., C.B., William James Nutting, Denis M. O'Connor, M.P., W. W. Rust, Mrs. Streatfield, G. M. Tagore, John Tennant, H. Payne Townshend, Dr. John A. Tulk, Robert Arthur Valpy, J. Sidney White.

One Guinea Members Admitted.—George T. Whish, Mrs. George T. Whish, Miss Reeve, M. McLean.

Mr. S. Jennings read a paper on the *Epacris*. He remarked the points of resemblance and distinction between the two natural orders *Ericaceæ* and *Epacridaceæ*, and the singular fact that in geographical distribution the two genera *Erica* and *Epacris* are scarcely ever found together, the former being natives of South

Africa, and the latter of Australasia, where very few *Ericaceæ* are to be found. Mr. Jennings next described the situations in which the *Epacris* is usually found growing, and deduced what kind of soil and treatment would naturally be the most suitable in cultivation, the main points of which were:—*Soil*, free and fibrous. *Light*, plenty without scorching. *Air*, free circulation without draught. *Pruning*, vigorous. *Water*, in moderation. The *Epacris* has become so thoroughly crossed and intercrossed in cultivation, that it is now almost impossible to arrange the garden forms into clearly defined species, and, worse than all, botanical names had been given to these hybrids so that the utmost confusion existed, and the task of arranging the genus into anything like order seemed almost impossible. Professor Bentham in his “*Flora Australiensis*” describes twenty-two species of *Epacris* as indigenous to Australia, and a few more are found in New Zealand; but only two or three species are common to both those countries. The chief points of distinction between the species are the comparative lengths of the calyx and the corollatube, and the lobes of the corolla. The four species distinguished by the large size of their flowers are:—*E. longiflora*, *E. reclinata*, *E. impressa*, and *E. sparsa*, of which, however, only the first and third are in cultivation. Under *E. longiflora* are arranged many of the garden varieties—*E. Lowii*, *E. multiflora*, *E. Devoniensis*, *E. carminata*, as well as *E. grandiflora* and *E. miniata*. Under *E. impressa* are grouped:—*E. variabilis*, *E. campanulata*, *E. ruscifolia*, *E. nivalis*, *E. ceræflora*, the whole of which have been described in distinct species. With reference to the collection at Chiswick, Mr. Jennings said it was probably the largest and most interesting that had ever been brought together, and he hoped to be able to prepare a more detailed statement of the different varieties for publication, and in order to illustrate the value of the reports which from time to time are issued by the Chiswick Board as the result of their protracted labours, he mentioned that one firm is sending out an *Epacris* under the name of *Devoniensis*; another sends out the same plant calling it *Carminata*, and a third calls it *Lucifer*, all three being identical, whilst the *Devoniensis* of different firms vary most considerably. Synonyms might be detected almost throughout the collection. Nothing could be gained by thus multiplying names which only proved vexatious; and it was greatly to the credit of the London nurserymen that they so cordially assisted the Chiswick Committee

in their efforts to bring order out of what otherwise would be such confusion.

SCIENTIFIC COMMITTEE.

SIR J. D. HOOKER, C.B., Pres. R.S., in the Chair.

Van Bol Tulip.—Mr. Elwes exhibited a specimen of the purple Van Bol Tulip, the peculiarity of which was that it appeared never to increase by offsets. A well-known Dutch horticulturist had given him three plants taken from his nursery where he had had two rows of them as long as he could remember—never more—they command no sale. He thought it was probably a Persian Tulip.

Diseased Bulbs.—The following communications were read, relating to the bulbs forwarded by Mr. Atkins on a former occasion:—

“The affection on the bulbs of Tulip and corms of Crocus is, as far as I am aware, undescribed. It is caused by one of the numerous forms of Sclerotium, but at present it is quite impossible to say what may be the perfect form. The Sclerotium resembles externally *S. complanatum*, but the structure is quite different, as is also that of *Rhizoctonia crocerum*, of which at first sight it seemed possible that it might be a form. The external tissue consists of irregular darker cells, beneath which are threads, more or less branched, resembling those of a mucor, mixed with hyaline cells much larger than the former. I have myself been able to trace to its perfect form the little gunpowder-like Sclerotium which is so destructive to Onions (*Journ. R. Hort. Soc.* iii., p. 98, f. 1-5.) Much information on the subject will be found in Lévillé's memoir in the *Annales des Sciences Naturelles*, October, 1843. I have placed the specimens on damp sand under a bell-glass, and should further development take place I will not fail to report it.—*M. J. Berkeley*.”

“I received for examination bulbs of Crocus, Snowdrop, and Cyclamen. In none could I find fungoid disease to account for the premature decay. In Snowdrop and Crocus there are one or two small black flattened Sclerotia, but these only on the outer coats. In Snowdrop one of the bulbs had the external fleshy coat permeated everywhere by mycelium, which on being kept moist and covered developed threads of *Penicillium glaucum*, the consequence and not the cause of decay. The decayed leaves of Cyclamen

produced no evidence of a parasite. The bulbs were sound. As far as these specimens are concerned I am of opinion that no disease of a fungoid nature exists in the bulbs to account for the decay, and that the cause must be sought in some external circumstances of soil or cultivation, and not in the bulbs themselves. I do not think that *Sclerotia* on the dried outer fibrous coats, and without any mycelium, have any connection with decay of the leaves.—*M. Cooke, March 18.*"

Distorted Branches of Horse Chestnut.—Sir J. Hooker showed some young branches of Horse Chestnut distorted in a peculiar manner. He observed it for the first time this year at Kew, where it had appeared in two or three places. The twig was abruptly curved out of its normal line of growth. He had carefully examined the branches for signs of injury by insects, but could detect nothing; nor had the shoot been pecked at by birds; nor was there any indications of fungoid growth to account for the distortion.

Acarus on Planes.—Sir Joseph Hooker also showed specimens of a minute scarlet *Acarus*, which had been found under the flaky outer bark, where it joins the living tissue of some plane trees, which had got out of health. They had not been seen in any other part of the gardens, though they had been searched for. It was considered that the insects were the consequence and not the cause of the ill-health of the trees. They were referred to Mr. McLachlan for report.

Flora and Fauna Turkestan.—Mr. McLachlan gave some particulars as to the great publication now taking place by various naturalists, Russians and others, illustrative of the natural history of Turkestan.

Rose Willow, &c.—Dr. Masters showed specimens from Mr. Parker of the formation known as Rose Willow, a tuft of leaves or scales increased in size from the attack of a *Cecidomyia*. A specimen of a fungus found growing on Japanese acorns was also exhibited, which was identified by Dr. Cooke as *Schizophyllum commune*.

Sports of Pteris arguta.—Mr. Moore showed specimens of this Fern from the Azores, presenting remarkable variations, particulars of which, together with some further information on this subject, will be found in a paper contributed by Mr. Moore to the Journal of the Society.

Fungoid Diseases of the Vine.—Dr. Cooke read the third part of his communication upon this subject, which is published in the present number of the Society's Journal.

Xiphion caucasicum.—Mr. Elwes showed a specimen of this singular green-flowered Iris with closely set two ranked leaves, common near Tiflis.

Erythronium sp. from Colorado, flowered this year for the first time ; it flowers erect, in which respect it differed from any other, it has been known in California for two or three years.

Narcissus rupicola from the Sierra de Guadarama near Madrid, allied to *N. juncifolius*, but distinct and better than any variety of that plant at present known.

FLORAL COMMITTEE.

Medals awarded.—Silver-gilt Flora to Messrs. Jas. Veitch and Sons, for groups of Hyacinths, Tulips, &c. ; Small Gold Banksian to Messrs. Osborne and Sons, for group of plants ; Silver Flora to Messrs. Cutbush and Son, for group of Hyacinths ; Bronze Flora to Messrs. Jas. Carter and Co., for group of Hyacinths ; Silver Flora to Mr. B. S. Williams, for group of plants ; Silver Banksian to Mr. J. Aldous, and also to Mr. J. Wills, for group of plants ; Bronze Flora to Mr. R. Dean, for group of hardy spring flowers. First-class certificates were awarded to Messrs. James Veitch, for *Hyacinth* "*King of Blacks*," for *Magnolia Halleana*, and for *Bollia Patinii* ; to Messrs. W. Cutbush and Son, for *Hyacinth* "*Grand Master* ;" to Messrs. Barr and Sugden, for *Narcissus incomparabilis aureotinctus Leedsii* ; to Mr. Mill, gardener to Lord Rendlesham, for *Odontoglossum pardinum*. Certificate of Botanical Commendation was awarded to the Society's gardens at Chiswick for *Dendrobium linguaforme*. Votes of thanks were passed to Mr. H. Parr, for *Begonia glaucifolia* ; to Mr. W. Caudwell, for cut flowers of *Polyanthus* ; to Mr. Mill, for cut bloom of *Cattleya Skinneri* ; to G. F. Wilson, Esq., F.R.S., for *Erythronium grandiflorum* ; to Mr. H. Cannell, for cut blooms of *Pelargonium* ; and to Messrs. Barr and Sugden, for cut blooms of *Iris stylosa* and *persicum*.

FRUIT COMMITTEE.

Cultural Commendation was awarded to Mr. Iggulden, gardener to R. B. Wingfield Baker, Esq., of Orsett Hall, Romford, for a dish of fine Tomatos, a cross between Sim's Mammoth and Hathaway's Excelsior.

APRIL 2, 1878.

ORDINARY GENERAL MEETING.

SIR CHARLES W. STRICKLAND, Bart., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Elections.—W. Ince Anderton, Gough Arbuthnot, Rev. W. Covington, M.A., J. Croucher, F. T. Davis, Mrs. G. Fenwick, Mrs. Fraser, G. H. Gordon, W. H. Gordon, G. M. Hicks, Mrs. Howse, D. Kemp, Mrs. E. Makins, Miss M. E. Makins, Sir T. Mosley, Bart., Miss M. C. J. Munro, F. Parry, Mrs. Parry, Mrs. Travers, the Hon. J. Welsh.

One Guinea Member Admitted.—Mrs. Desvæux.

SCIENTIFIC COMMITTEE.

SIR JOSEPH D. HOOKER, C.B., President R.S., in the Chair.

Zanzibar Coffee Borer.—The Chairman showed specimens of branches of Coffee shrub from Zanzibar, the whole of the pith of which was bored vertically by the lava of some large beetle, probably one of the Buprestidæ (according to Mr. McLachlan). The bark and wood were also perforated in a very peculiar manner with funnel-like holes, the broad end of the aperture being inside. He was of opinion that the boring into the wood had nothing to do with the boring inside.

Slug-Eating Dionæa.—From Mr. Green, gardener to Sir George MacLeay, came a specimen of *Dionæa* in bad condition. It was supposed that the plant's ill-health might have arisen from too free indulgence in slugs.

Catalpa Wood.—Dr. Masters showed from Professor Sargent, of Cambridge, U.S., a piece of *Catalpa* wood cut from the lower end of a post after it had stood in the ground for seventy-five years. The wood was still firm and hard, much more so than is the case with *Catalpa* grown in this country.

Gemmiferous Cardamine.—From Mr. Wilson Saunders came a drawing and note relating to the production of buds on the leaves of *Cardamine pratensis* (which he has been cultivating, as it showed in the wild state a tendency to produce double flowers) and which during the winter had made some young plants from the

axils of a leaf happening to get into a position flat and somewhat pressed into the soil. This particular growth was shown to the natural size on the sketch. The leaf was an old one, and the midrib retained still much vitality, even to the terminal leaflet, while the leaflets themselves gain vitality the more they approach the leaf base. It is worth notice that the young plants spring from the leaflets on the right side of the leaf, except the terminal one. A minute ball-like enlargement is observable at the base of each young plant, round which a number of fine hair-like pellucid roots are given out.

Staminody in Colletia.—Mr. Wilson Saunders also sent a drawing and note relating to the occurrence of a stamen on the pistil of *C. spinosa* :—

“Making a drawing last spring of a species of *Colletia* which I raised from seeds received from Chili, I was surprised to find that in one of the flowers the pistil was deeply lobed at the apex, and that a very complete stamen and anther had sprung up between two of the lobes.” The *Colletia* is, I believe, the species which is named *horrida*, an old inhabitant of our gardens.

Hakea adnata.—Mr. Saunders likewise sent specimens of this plant, together with the following communication :—

“The plant of *Hakea adnata*, R. Br., from which the accompanying specimens were taken, is trained against a wall facing south in a sheltered situation. I raised it from seeds sent from Australia, and the plant is now much branched, and about four feet high. It is at present one mass of primrose-coloured flowers, which, although small, from their great number, produce a very pleasing effect. The plant has been in its present situation three years, and only received protection from frost during the first winter it was placed in the ground. I had thought the plant was *Hakea pugioniformis* Cav., but I am informed from very high authority that it is the *Hakea adnata*, R. Br. I may mention that the plant is growing in a rich light loamy soil. It was covered with snow this morning. W. W. Saunders, Raystead, Worthing, April 1.”

Diseased Bulbs, &c.—With reference to the reports laid before the Committee at its last meeting, Dr. Cooke made the following remarks :—

“Dr. Cooke explained, with reference to the reports made to the last meeting of the Committee, that each person reported on the material before him, and that it was not accurate to assume that there was any difference of opinion between Mr. Berkeley and himself on the subject. Since he had seen the Rev. M. J. Berke-

ley's report he had examined again the specimens which had been assigned to him, every atom of which had still been kept, and he could affirm that on the two Snowdrop and three Crocus bulbs there were no affected leaves on which the Sclerotium could be found which had been alluded to by Mr. Berkeley, only two or three small flattened black Sclerotia upon the outer dry coats of the bulbs. This explanation was necessary, as a wrong impression seemed to have obtained currency. Each person could report only upon the material before him, and in his case there seemed to be no diseased leaves present except of Cyclamen, of which he had several, and two bulbs, none of which were in Mr. Berkeley's portion, but on these no Sclerotia of any kind could be found. Hence each person might be equally accurate, and equally justified in the conclusion at which he had arrived."

Monstrous Laburnum.—Miss Ormerod sent a branch of *Laburnum* in which the main shoot was pendulous, and gave off near its extremity numerous thick branches which resumed the upright direction. The whole appearance was thus not unlike that of a candelabrum.

Plants Exhibited.—Mr. Elwes showed flowers of *Tulipa Gesneriana* var. *Schrenkii*, which he thought to be the origin of the Scarlet Von Thol. He also showed a lovely Tulip from Crete, where it was collected by Mr. Maw. The colour is pale lilac, with a yellow eye. The specimen was referred to Mr. Baker for identification. Flowers of *Narcissus rupicola* and *Eucharis candida* were also shown—the last a beautiful plant, which is very hardy (from the Western Andes), and when better known will surely supersede the favourite *Amazonica*; a very free flowering plant in a cool house.

Mr. Harpur-Crewe showed two forms of *Scilla italica*, one with erect leaves, flowering early, and one with reflexed leaves, flowering relatively late.

Mr. G. F. Wilson showed, on the part of Miss Kingsley, a Primrose gathered by her at Murren, Switzerland, and which was referred to Mr. Baker for identification.

Mr. Elwes showed a drawing of *Lilium Washingtonianum* from a superb specimen flowered in Mrs. Bateman's garden at Kensington, in which seemingly unlikely situation *Pancratium maritimum* also flowers.

FLORAL COMMITTEE.

Medals Awarded.—Silver Banksian to Messrs. Osborn and Son, for group of plants; to Mr. J. Aldous, for ditto; to Mr. H. Heims,

for group of orchids. Small Gold Banksian to Messrs. Jas. Veitch and Sons, for groups of Orchids, Roses, and Amaryllis. Bronze Banksian to Mr. J. Levesley, for groups of Cinerarias, Cyclamen, and Polyanthus. Silver Flora to Mr. B. S. Williams, for group of plants. Bronze Flora to Messrs. Barr and Sugden, for group of Daffodils. First-class Certificates were awarded to H. Little, Esq., for *Amaryllis* "*Crimson Banner*"; to Mr. R. Dean, for *Primrose* "*Prince Charming*." Certificate of Botanical Commendation to Mr. B. S. Williams, for *Masdevallia radiosia*; and votes of thanks were passed to Sir Charles Strickland, Bart., for *Crinum campanulatum*; to Mr. R. Dean, for *Primula intermedia* and seedling varieties, and to Mr. C. Green, gardener to Sir G. Macleay, for *Crinum pendunculatum*.

In the competition for the prizes offered by an Amateur for the best dark seedling Amaryllis the first prize was awarded to H. Little, Esq., for "*Crimson Banner*," and the second prize to Mr. B. S. Williams, for "*Dr. Hogg*." The prizes for light seedlings were withheld.

FRUIT COMMITTEE.

Votes of thanks were awarded to Mr. J. Atkins, gardener to Col. Loyd-Lindsay, M.P., for bunches of Black Alicante Grape, and to Mr. M. McLean, Linton Park, Maidstone, for variegated Kales. Mr. J. Pink, gardener, Lee's Court, Faversham, contributed a seedling Apple, Baron Leibig, said to be a cross between King of the Pippins and Ribston Pippin, though not so good as either.

APRIL, 16, 1878.

ORDINARY GENERAL MEETING.

Lord ALFRED S. CHURCHILL in the Chair.

The Minutes of the last Meeting were read and confirmed, and the Assistant Secretary announced the awards of the Fruit and Floral Committees.

Elections.—James T. Chance, J.P., Major-General W. A. Fyers, J. S. Hansom, Mrs. M. Holroyd, His Highness Prince Ibrahim Hilmy of Egypt, Herbert G. H. Norman.

Guinea Members.—Col. Cockburn Hood, Miss M. Howse, Miss M. Hutton, Sutton Abbott, A. Hurst, Rev. John G. Nelson.

Mr. S. Jennings delivered an address on the subject of the International Horticultural Exhibition at Ghent, which he had attended as a delegate from the Society. He remarked that these quinquennial shows, which are of so attractive a nature, should have a peculiar interest to the Fellows of the Royal Horticultural Society, because it was from visiting the shows of this Society at the commencement of the present century that the notion was carried by a Belgian horticulturist to Ghent, leading to the formation of the *Société Royale d'Agriculture et de Botanique*, under whose auspices these international gatherings were first instituted in 1809. After describing the preparations for the arrangement and judging of the show, Mr. Jennings proceeded to remark upon its principal features, the new and interesting plants, and the effect of the general display; and, in alluding to the genial cordiality with which the Belgians had entertained their foreign visitors, Mr. Jennings suggested that, as no international horticultural exhibition had been held in this country since 1866, it was now time that steps should be taken to make the necessary arrangements for holding such a meeting in the course of next year or the year following.

Dr. Masters, F.R.S., in proposing a vote of thanks to Mr. Jennings for his lecture, expressed his concurrence in the opinion that the time had now come when the Council of the Society should make a definite move and call a meeting to consider the feasibility of the proposition.

Mr. B. S. Williams and G. F. Wilson, F.R.S., both expressed their opinion that such an international exhibition was not only desirable but possible, and that, should it be determined upon, every effort would certainly be made to render it a finer exhibition even than that of 1866.

Lord Alfred Churchill said, on the part of the Council, that the subject was one in which they were greatly interested, and promised that the suggestions now made should receive attentive consideration.

SCIENTIFIC COMMITTEE.

Sir JOSEPH D. HOOKER, C.B., President R.S., in the Chair.

Fungoid Diseases of the Vine.—Dr. M. C. Cooke read a further communication on this subject, which will appear in the present number of the Journal.

Encephalartos lanuginosus.—From Mr. Tillett, Sprowston Lodge, Norwich, came a noble cone of this species, weighing $29\frac{1}{2}$ lbs., also a leaf of the same. The cone first became conspicuous in July, 1876. Mr. Tillett finds the plant succeeds admirably out of doors in the summer weather.

Sir Joseph Hooker remarked that if these plants are exposed in the open air, without protection even in summer, and there happened to be a cold or stormy month, they are so severely injured that years may elapse before they get into condition again. For this reason they had quite given up putting them out at Kew. He was afraid that the seeds in the cone were not likely to be fertile.

Hybrid Cypridium.—Dr. Masters showed, on the part of Mr. Douglas, a hybrid raised between *Cypridium villosum* as the male parent, and *C. barbatum* as the female parent. The result was much more like *villosum* than *barbatum*, but if the cross be made in the opposite direction, the offspring more nearly resembles the last-named; thus showing that the pollen parent in this case exercises the more potent influence.

Fasciated Mistleto.—Dr. Masters also showed, from Mr. Corderoy, a specimen of Mistleto with very numerous contracted branches, forming a tufted growth of peculiar appearance, which is said by Mr. Corderoy to be constant.

Curved Branches of Horse Chestnut.—Adverting to some specimens lately exhibited by the President, Dr. Masters showed a branch wherein the buds on one side of the stem were greatly reduced in size, those on the opposite side being of the ordinary size. In consequence of this a curvature had taken place along the free growing side.

Monstrous Iris.—Mr. M. P. Edgeworth showed a drawing of a monstrous Iris, in which the sepals were like the petals in appearance, and in which a fourth anther was present.

Disease in Ash.—Mr. Wilson Saunders contributed a paper, accompanied by beautiful drawings, illustrative of a peculiar ulceration or canker in the bark of the common Ash.

Picea Pinsapo.—A specimen of this was exhibited, showing a peculiar tufted form analogous to the *Clanbrassil Fir*.

Seedling Primrose.—Mr. G. F. Wilson exhibited a seedling Primrose, the colour of which showed an approximation to that of the Chinese species.

Hybrid Amaryllis.—Colonel Clarke showed flowers of an *Amaryllis*, the result of crossing *A. pardina* and *A. aulica*.

Various plants of interest were exhibited, some of which were sent up as subjects of interest from the Floral Committee, while others were submitted merely for the purpose of obtaining their names. A discussion arose as to the desirability of the Committee, as such, undertaking the naming of plants, but no formal conclusion was arrived at.

FLORAL COMMITTEE.

Medals Awarded.—Gold Banksians to Sir Trevor Lawrence, Bart., M.P., for his magnificent group of Orchids; to Mr. John Wills, Mr. B. S. Williams, and Messrs. W. Rollisson and Sons, for groups of plants; to Messrs. Barr and Sugden, for collection of Daffodils; and to Messrs. Jas. Veitch and Sons, for group of Clematises, Roses, and Amaryllis. Silver-gilt Banksian to Messrs W. Cutbush and Son, for group of plants; Silver Banksian to Mr. J. Aldous, for group of plants.

First-class Certificates were awarded to Mr. W. Bull, for *Adiantum tetraphyllum gracile*, also for *Davallia fijiensis*; to Messrs. Rollisson and Sons, for *Grevillea robusta* var. *filicifolia*; to Mr. R. Wm. Parker, for *Caltha palustris* fl. pl. minor, and *Megasea* (*Saxifraga*) *purpurascens*; to Messrs. J. Veitch and Sons, for *Crinum bracteatum*; to Mr. B. S. Williams, for *Wallichia zebrina* and *Amaryllis* "*E. Pilgrim*;" to Mr. C. Green (gardener to Sir G. Macleay), for *Diotis Huttoni*. Botanical Commendation was awarded to Mr. Bull, for *Alocasia Johnstoni*. Cultural Commendation (with votes of thanks) to Mr. J. Walker, Messrs. H. Lane and Sons, and Mr. J. Scott, for their respective collections of Roses (cut blooms). Votes of thanks were awarded to Messrs. F. and A. Smith, for cut blooms of *Cineraria*; to Mr. W. Bull, for *Odontoglossums*; to Mr. G. Ambler (gardener to Mrs. Jennings), for his basket of Alpine *Primulas*; to Mr. R. Dean, for hardy spring flowers; to Mr. H. Hooper, for cut blooms of *Pansies*; to the Hon. and Rev. J. T. Boscawen, for *Amaryllis* "*Beauty of Cornwall*;" to Mr. G. F. Wilson, for new seedling primrose or Polyanthus, *Alice Wilson*; to Mr. W.

H. Tillett, for cone of *Encephalartos*; to Lord Rendlesham, for a plant of *Cattleya Skinneri*; and to Sir G. Macleay, for a group of Terrestrial Orchids.

FRUIT COMMITTEE.

Cultural Commendation to Mr. W. Wildsmith (gardener to Viscount Eversley), for dish of Strawberries. Votes of Thanks were passed to Mr. J. Woodbridge (gardener to the Duke of Northumberland), for Purple Sea Kale, and to Mr. J. H. Goodacre (gardener to the Earl of Harrington) for dish of Onions.

MAY 7, 1878.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice-President, in the Chair.

The Minutes of the last Meeting having been read and signed, the awards of the Fruit and Floral Committees were announced.

Elections.—Thomas Benskin, Mrs. Bolton, Mrs. Buchanan, J. Scarlett Campbell, David Carnegie, Lady Emily Cavendish, Admiral The Hon. Sir James Drummond, Lady Augustus Fitz-Clarence, Captain Thomas Gardner, Charles Clayton Glyn, William Grogan, William Hurst, R. R. Hyatt, Major The Hon. C. J. Keith-Falconer, Hon. Mrs. Locke-King, John Jekyll Kingsford, Robert A. Laing, George Murray Lang, Major Lawrie, James Ebenezer Saunders, F.L.S., Mrs. Arthur Tower, Lady Turing, Lady Westbury, Charles K. Wild, Arthur J. Wright.

One Guinea Members Admitted.—Miss Desvœux, William Beddoe, Miss Kate Jurgensen, Henry Armstrong.

The Chairman then announced that His Majesty the King of the Belgians, whose deep personal interest in the science of Horticulture was well known, had been graciously pleased to accept the nomination of the Council as an Honorary Fellow of the Society. He now asked the meeting to confirm the election in the usual way. His Majesty was accordingly elected an honorary member of the Society.

Mr. H. J. Elwes, a member of the Council, delivered a lecture

on "*Tulips*," illustrated by a large number of specimens and plates. The greater portion of the lecture will be published in the next number of the Journal. At the conclusion of the lecture the Rev. H. Harpur Crewe made a few observations, and proposed a vote of thanks to Mr. Elwes, which was carried unanimously.

Lord Alfred Churchill stated that the Council has called a meeting of all horticulturists interested in the proposed International Exhibition of Horticulture, which he hoped would lead to the formation of a committee for the purpose of carrying out the suggestion.

SCIENTIFIC COMMITTEE.

Sir JOSEPH D. HOOKER, C.B., President Royal Society, in the Chair.

Exudation from Birch Bark, &c.—Dr. M. C. Cooke showed specimens of the bark of the Birch with a whitish exudation, which was supposed to be of a sugary nature, but which chemical analysis proved to be gummy. He also showed specimens of Wheat from the north-west provinces of India of so fine a quality as to be worth nearly as much as the Australian Wheat in the market.

Hybrid Plants.—Rev. H. H. Crewe showed an accidental hybrid between *Iberis Garrexiana* and *I. ciliata*, also leaves of a hybrid between two species of *Symphytum*. Dr. Masters showed, on the part of Messrs. Veitch, leaves of a hybrid between a species of *Alocasia* and *Caladium Chantinii*. Mr. Elwes showed a remarkable hybrid Iris raised by Mr. Max Leichtlin between *I. susiana* and *I. iberica*, with the habit of the former and the flower of the latter, named "*I. Van Houtte*."

Monstrous Fuchsia.—Dr. Masters showed from Mr. Harrison Weir flowers of a Fuchsia, in which the petals were either wholly or in part absent, while the stamens had their anthers dilated into petaloid, spoon-shaped processes, resembling the petals of *Lopezia*. From the same gentleman came flowers of a Polyanthus, with the margins of the petals rolled inwards, with the outer surface of the petals as deeply coloured as the inner, and with the stamens and pistils both short and of about equal length.

Galls of Oak.—Mr. MacLachlan alluded to some recent researches on the dimorphism and alternations of generations in sundry *Cynipidæ*. Not only do the insects exist under two

different forms, different enough to warrant their being placed in distinct genera (as they had been) if their origin were not known, but the gall produced by the same insect in its different stages is also different. Dr. Adler, of Schleswig, had recently asserted that the following species should be so associated, viz.:—

<i>Neuroterus lenticularis</i>	with	<i>Spathogaster baccarum</i>
„ <i>fumipennis</i>	„	„ <i>albipes</i> .
„ <i>numismatis</i>	„	„ <i>vesicatrix</i> .
<i>Dryophanta scutellaris</i>	„	<i>Trigonaspis megaptera</i> .
„ <i>longiventris</i>	„	<i>Spathogaster taschenbergi</i> .
<i>Philothrix radialis</i>	„	<i>Andricus noduli</i> .

These statements at first met with considerable incredulity, and even ridicule, but their truth—at any rate, so far as the association of *N. lenticularis* (the Oak-spangle) with *S. baccarum* (the Currant-gall), and of *N. numismatis* with *S. vesicatrix*—had been abundantly confirmed by three independent observers, viz., Mr. Fletcher, of Worcester; Mr. Cameron, of Glasgow; and Monsieur Lichtenstein, of Montpellier.

Plants Exhibited.—Mr. Elwes showed *Ismene viridiflora*; *Bomarea Caldasii*, the flowers of which were produced in about eighteen months from the seedling state; two species of *Zygadenus* in flower, also a beautiful *Camassia*, a form of *esculenta*; *Primula mollis*, from Bhotan and Sikkim; and, in reply to an inquiry, Mr. Elwes stated that he did not know that any Primrose had ever been found in Tropical America. *Hemantus hirsutus*, from Messrs. Veitch; and *H. pubescens*, the leaves and spathe of which are covered with short silvery hairs; *Paeonia corallina*, one of the very earliest to flower, quite hardy out of doors; *Fritillaria Messanensis* (2 sp.), and *F. (Amblirion) Forbesii*, Baker; also from Sir G. Macleay, a specimen of *Orchis tephrosanthes* from Rome. Mr. Wilson Saunders sent flowers of *Grevillea juniperina* var. *sulphurea*, a proteaceous shrub, raised from Australian seeds, and grown against a south wall in loam and peat—it was stated to be a very pleasing plant—and of a *Colletia*; both of which are quite hardy at Worthing.

FLORAL COMMITTEE.

Medals Awarded.—Large Gold Banksians to Messrs. Jas. Veitch and Sons, for group of plants, and to Sir Trevor Lawrence, Bart., M.P., for group of Orchids. Small Gold Banksians to Mr. J.

Wills and to Messrs. W. Rollisson and Sons, for groups of plants. Silver-gilt Flora to Mr. C. Turner, for group of plants. Silver-gilt Banksians to Messrs. H. Lane and Son, for group of Roses in pots, and to Mr. B. S. Williams, for group of plants. Silver Flora to Messrs. W. Paul and Son, for Roses in pots and cut blooms. Silver Banksian to Messrs. Paul and Son, for cut blooms of Roses; to Mr. J. Aldous and to Messrs. Osborn and Sons, for groups of plants. Bronze Banksians to E. Winn, Esq., for specimen plant of *Odontoglossum cirrhosum*; and to Messrs. Mayo and Son, for cut blooms of Rose "*Maréchal Niel*." First-class Certificates were awarded to J. Atkins, Esq., for *Saxifraga calyciflora*; to Messrs. J. Veitch and Sons, for *Coleus* "*George Bunyard*," *Rhipidopteris peltata gracillima*, *Adiantum Lawsonianum*, *Primula acaulis sulphurea major*, and *Azalea* "*Madame E. Eeckhaute*"; to Mr. B. S. Williams, for *Anemidictyon phyllitides tessellata*, *Adiantum Lawsonianum* and *Colrus* "*Kentish Fire*"; to Mr. J. Wills, for *Gloxinia* "*Beauty of Anerley*"; to Mr. J. Douglas (gardener to F. Whitbourn, Esq.), for Alpine *Auricula* "*Silvia*"; to Mr. R. Dean, for *Aquilegia alpina superba*; to Mr. W. Bull, for *Marica pacifica*; to H. J. Elwes, Esq., for *Iris Leichtlinii* and *Camassia Brownii* (?); to Rev. H. N. Ellacombe, for *Bomarea Caldasi*. Second-class Certificate to Messrs. J. Veitch and Sons, for *Azalea* "*Kaiser Wilhelm*." Botanical Commendations to J. Atkins, Esq., for *Androsace sarmentosa*; to Messrs. J. Veitch and Sons, for *Dioscorea retusa*; to Mr. C. Green (gardener to Sir G. Macleay), for *Iochroma elegans*. Cultural Commendation to Mr. C. Green, for *Houstonia cœrulea*. Votes of Thanks were passed to J. Day, Esq., for *Cypripedium Stonei* var.; to Messrs. Barr and Sugden, for cut blooms of *Anemones*, &c.; to Robert Warner, Esq., for *Masdevallias*, cut flowers; to Rev. A. Rawson, for *Celsia cretica*; to Mr. R. Parker, for group of hardy herbaceous plants; to Mr. W. Iggulden (gardener to R. B. W. Baker, Esq.), for basket of Roses; to Mr. J. H. Goodacre (gardener to the Earl of Harrington), for cut flowers of *Bougainvillea* and *Stephanotis*; and to J. J. Whible, Esq., for Rhododendrons, cut blooms.

FRUIT COMMITTEE.

Cultural Commendations to Mr. R. Gilbert (gardener to the Marquis of Exeter), for collection of Vegetables; to Mr. G. T. Miles (gardener to Lord Carington), for two dishes of Cherries.

Votes of Thanks were passed to Mr. W. Iggulden (gardener to R. B. W. Baker, Esq.), for collection of Forced Fruit; and to L. A. Killick, Esq., for five dishes of Apples.

MAY 21, 1878.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice-President, in the Chair.

The Minutes of the last Meeting were read and confirmed.

Elections.—Captain W. de W. Abney, R.E., F.R.S., Mrs. Gough Arbuthnot, Rev. W. M. Banks, Wm. Fulford Brown, Lieut.-Col. Henry Thomas Butler, Right Hon. Sir Henry Cotton, John Foy, W. H. Holroyd, Thomas Tipping Lawden, William Lee, Mrs. Loch, Mrs. J. Fletcher Moulton, William H. Parry Okeden Admiral Right Hon. Lord Clarence Paget, KCB., Joseph Rowlands, H. R. Sperling, David Syme, Acton Tindal, Arthur Powys Vaughan, George Crosbie Wylie.

Guinea Members Admitted.—Messrs. A. D. Mackay and J. H. Bainbrigge.

The awards of the Committees were announced, and the Assistant Secretary made some remarks upon the more interesting plants exhibited.

SCIENTIFIC COMMITTEE.

SIR JOSEPH D. HOOKER, C.B., Pres. R.S., in the Chair.

Variegated Acer.—Specimens of the leaves of an Acer which had sported into a scarlet variegation were shown by the President on the part of Sir Philip Egerton, Bart., together with a letter in which he stated that this sport was first seen by Messrs. Hook and Yeats, of Chester, who said that a month ago the colour was most brilliant; they have succeeded in fixing and propagating the sport, and have now several plants. This tree, if constant, would be a great gain for landscape gardeners.

Coccus on Rose.—Mr. Hiern exhibited twigs of a Maréchal Niel Rose infested with a gigantic coccus, from a plant growing on an

east wall in a garden in Devonshire. The tree is an old one, and for the last three or four years had not flowered so well as formerly, but no disease had been observed previously to this year. He was anxious to know what treatment should be observed to prevent extension of the malady. The Chairman did not think that there was any effectual remedy except by burning the parts affected. Petroleum and soft soap might be tried. Mr. Moore stated that he had observed a similar, if not identical, coccus on a plant of *Ribes Menziesii* in the Chelsea garden, and that these had been named *Coccus Oxyacanthæ* by Mr. Westwood. He was not aware, however, that it had ever before been seen on a Rose.

FLORAL COMMITTEE.

Medals awarded.—Small gold Banksian to Mr. J. Wills, for group of plants; Silver-gilt Banksian to Messrs. W. Rollisson and Sons, for group of plants. Bronze Flora to Mr. J. Aldous, for group of plants. First-class Certificates were awarded to Messrs. J. Veitch and Sons, for *Hæmanthus Kalbreyeri*; to Mr. B. S. Williams, for *Adiantum Neoguineense*, *Ptychosperma rupicola*, *Cycas media*, *Sadleria cyathioides*, and *Alsophila plumosa*; to Mons. Duval, for *Gloxinias* “*Mont Blanc*” and “*Boule de Feu*”; to Mons. V. Lemoine, for ivy-leaved double *Pelargonium* “*A. F. Barron*”; to Messrs. J. Laing and Co., for *Begonia* “*President Burelli*”; to G. F. Wilson, Esq., F.L.S., for *Lilium tenuifolium*. Botanical Commendation to Messrs. J. Veitch and Sons, for *Liparis elegantissima*. Votes of Thanks were passed to H. J. Buchan, Esq., for *Cymbidium tigrinum*; to Mr. H. Cannell, for *Pelargoniums*, cut blooms; to Mr. J. Douglas (gardener to F. Whitbourn, Esq.), for cut blooms of *Aquilegia hybrida cærulea*; and to J. J. Wheble, Esq., for cut blooms of Azaleas.

FRUIT COMMITTEE.

A Cultural Commendation was awarded to Shirley Hibberd, Esq., for four pans of Erfurt Sweet Cress; and a Vote of Thanks was passed to Mr. W. Divers (gardener to W. Moore, Esq.) for seven dishes of Apples.

MAY 28, 1878.

THE GREAT SHOW.

This great Summer Exhibition was acknowledged by all to have been the most magnificent horticultural display that has been seen in this country since the great International Show in 1866. The Society was honoured at the opening by the presence of H.R.H. the Princess of Wales, also of their Imperial Highnesses the Crown Prince and Princess of Germany, and H.R.H. Prince Waldemar of Denmark, who were received by the President of the Society, Lord Aberdare, and the Members of the Council, by whom the royal visitors were conducted through the extensive Exhibition. H.R.H. the Prince of Wales was prevented by slight indisposition from being present.

The Council Room was devoted to a display of table decorations from Messrs. Mortlock, of Oxford Street, and Mr. J. Aldous; and a most interesting collection of skeletonised leaves and pods by Mrs. Cussons, of Southport, to whom the Gold Banksian Medal of the Society was awarded.

The long tent leading from the steps of the Council Room to the covered way to the entrance of the large marquee was devoted on the one side, to cut flowers, fruit, vegetables, and on the other to Cacti, Orchids, and new plants, and collections of hardy Alpine shrubs. From the end of this long tent, and extending in a northerly direction, was another extensive tent, filled with a variety of miscellaneous plants of great beauty and rarity, and groups of pelargoniums and miniature succulents.

The *coup d'œil* of the large marquee was very magnificent, and as regards the extraordinary bank of Roses exhibited by Mr. C. Turner, of Slough, quite unprecedented. Such a display is scarcely likely to be seen again from a single exhibitor for some time. The central group, arranged by Messrs. J. Veitch and Sons, was a masterpiece of skill in effective disposition of form and colour. The central palm, a splendid specimen of *Kentia Fosteriana*, was surrounded by graceful foliage, brilliant spathed Anthuriums, rare and costly Orchids, curious and interesting Nepenthes, and other tropical gems, whilst masses of Ferns, Gloxinias, and Begonias completed a most tastefully-arranged group, to which a Gold Medal was awarded.

The arrangement of Mr. J. Wills's fine group of plants was

characteristic and very effective, contrasting wonderfully with Messrs. Veitch and Sons', and yet in its way quite as successful. Opposite to Mr. Wills's group was that arranged by Mr. J. Aldous—winning the Second Prize—to Mr. Wills' lead, these two groups completely contrasting with each other: the former in charming imitation of Nature—Orchids, Gloxinias, Amaryllis, &c., nestling in mossy banks, under the shade of overspreading foliage, as though they had always grown there; the latter rich in variety and contrast of straight lines of harmonious colour, tier upon tier, producing a very striking effect.

Mr. Bull's valuable group of Orchids, Palms, Tree Ferns, and new and rare plants presented a most effective appearance. Such dense masses of Odontoglossums, including *O. Alexandræ*, *O. vexillarium*, *O. Pescatorei*, &c., had seldom before been seen, and were especially noticed by the Princess, to whom the first-named species was dedicated upon the occasion of her Royal Highness's first visit to the Society.

Other groups and banks of floral beauty occupied striking positions under the great marquee, the whole contributing to render the great Show of 1878 one of the finest that has ever been brought together.

The number of visitors on each day of the Show, exclusive of Fellows of the Society and holders of complimentary and free tickets, was as follows:—

On May 28.....	1945
„ 29.....	3012
„ 30.....	3409
„ 31.....	4835

Total number of visitors.....	13,201
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The following is the official list of the awards given on this occasion:—

AWARD OF THE JUDGES.

CLASS 1.—12 STOVE or GREENHOUSE PLANTS, in flower, distinct. (Open.)

1st. J. F. Greswold Williams, Esq., Henwick Grange, Worcester (E. Tudgey, Gr.), £20.

2nd. Messrs. T. Jackson & Son, The Nurseries, Kingston-on-Thames, £15.

3rd. Mr. J. Peed, Roupell Park Nurseries, Norwood Road, S.E., £10

CLASS 2.—8 STOVE or GREENHOUSE PLANTS, in flower, distinct. (Nurserymen.)

1st. Messrs. T. Jackson & Son, £10.

2nd. Mr. B. S. Williams, Victoria and Paradise Nursery, Upper Holloway, £7.

3rd. Mr. J. Peed, £5.

CLASS 3.—8 STOVE or GREENHOUSE PLANTS, in flower, distinct. (Amateurs.)

- 1st. Mrs. Torr, Garbrand Hall, Ewell, Surrey (J. Child, Gr.), £10.
- 2nd. J. F. Greswold Williams, Esq. (E. Tudgy, Gr.), £7.
- 3rd. Mr. G. Wheeler, Gardener, St. John's Lodge, Regent's Park, N.W., £5.

CLASS 4.—15 ORCHIDS, distinct. (Amateurs.)

- 1st. His Grace the Duke of Richmond and Gordon, Goodwood (F. Rutland, Gr.), £20.
- 2nd. F. Whitbourne, Esq., Loxford Hall, Ilford, Essex (J. Douglas, Gr.), £15.

CLASS 5.—15 ORCHIDS, distinct. (Nurserymen.)

- 1st. Mr. B. S. Williams, £15.
- 2nd. Messrs. T. Jackson and Son, £10.

CLASS 6.—10 ORCHIDS, distinct. (Amateurs.)

- 1st. Mrs. Torr (J. Child, Gr.), £12.

CLASS 7.—6 ORCHIDS, distinct. (Nurserymen.)

- 1st. Mr. B. S. Williams, £6.
- 2nd. Messrs. T. Jackson and Son, £4.
- 3rd. Mr. Henry James, Castle Nursery, Lower Norwood, £2.

CLASS 8.—9 NEW PLANTS, not in commerce, in or out of flower. (Open.)

- 1st. Mr. W. Bull, King's Road, Chelsea, S.W., £6.
- 2nd. Mr. B. S. Williams, £4.

CLASS 9.—12 NEW PLANTS, sent out in the years 1875, 1876, and 1877. (Open.)

- 1st. Mr. W. Bull, £8.
- 2nd. Mr. B. S. Williams, £6.

CLASS 10.—8 GREENHOUSE AZALEAS, distinct. (Nurserymen.)

- 1st. Withheld.
- 2nd. Mr. C. Turner, Royal Nurseries, Slough, £7.
- 3rd. Messrs. T. Jackson and Son, £5.

CLASS 11.—8 GREENHOUSE AZALEAS, distinct. (Amateurs.)

- 1st. R. Thornton, Esq., The Hoo, Sydenham Hill, S.E. (A. Ratty, Gr.), £12.
- 2nd. Mrs. Torr (J. Child, Gr.), £9.
- 3rd. D. Martineau, Esq., Clapham Park, S.W. (James Weston, Gr.), £7.

CLASS 12.—15 GREENHOUSE AZALEAS, in pots not exceeding 12 inches in diameter. (Open.)

- 1st. R. Thornton, Esq. (A. Ratty, Gr.), £8.
- 2nd. Mr. C. Turner, £6.

CLASS 13.—8 ERICAS, distinct. (Nurserymen.)

- 1st. Messrs. T. Jackson and Son, £10.
- 2nd. Mr. J. Peed, £7.

CLASS 14.—8 ERICAS, distinct. (Amateurs.)

- 1st. J. F. Greswold Williams, Esq. (E. Tudgy, Gr.), £10.
- 2nd. D. Martineau, Esq. (J. Weston, Gr.), £7.
- 3rd. Mr. G. Wheeler, £5.

CLASS 15.—8 FINE-FOLIAGED PLANTS. (Amateurs.)

- 1st. J. Warren, Esq. (C. Rann, Gr.), Handcross Park, Sussex, £12.
- 2nd. J. F. G. Williams, Esq. (E. Tudgy, Gr.), £8.
- 3rd. Rev. Canon Bridges, Beddington, Surrey (T. Penfold, Gr.), £5.

CLASS 16.—8 FINE-FOLIAGED PLANTS. (Nurserymen.)

- 1st. Mr. B. S. Williams, £10.
- 2nd. Messrs. Hooper and Co., Covent Garden, W.C., £7.

CLASS 17.—15 FINE-FOLIAGED PLANTS in pots not exceeding 12 inches in diameter. (Open.)

- 1st. Mr. W. Bull, £8.
- 2nd. Mr. B. S. Williams, £6.
- 3rd. Messrs. Hooper and Co., £4.

CLASS 18.—GROUP of MISCELLANEOUS PLANTS, arranged for effect, and occupying a space not exceeding 300 square feet.

- 1st. Mr. J. Wills, Onslow Crescent, South Kensington, S.W., £10.
- 2nd. Mr. J. Aldous, Florist, Gloucester Road, South Kensington, S.W., £7.

CLASS 19.—9 SHOW PELARGONIUMS, distinct, in pots not exceeding 8 inches in diameter. (Nurserymen.)

- 1st. Mr. C. Turner, £9.

CLASS 20.—9 SHOW PELARGONIUMS, distinct, in pots not exceeding 8 inches in diameter. (Amateurs.)

- 1st. W. F. Watson, Esq., Redlees, Isleworth (J. James, Gr.), £9.
- 2nd. Mrs. Hodgson, The Elms, Hampstead (J. Weir, Gr.), £6.

CLASS 21.—9 FANCY PELARGONIUMS, distinct, in pots not exceeding 8 inches in diameter. (Nurserymen.)

1st. Mr. C. Turner, £7.

CLASS 22.—9 FANCY PELARGONIUMS, distinct, in pots not exceeding 8 inches in diameter. (Amateurs.)

1st. W. F. Watson, Esq. (J. James, Gr.), £7.

2nd. Mrs. Hodgson (J. Weir, Gr.), £5.

CLASS 23.—6 STOVE or GREENHOUSE FERNS, large specimens, distinct. (Amateurs.)

1st. Mrs. Torr (J. Child, Gr.), £9.

2nd. J. F. Greswold Williams, Esq. (E. Tudgey, Gr.), £6.

3rd. F. Whitbourne, Esq., Loxford Hall, Ilford (J. Douglas, Gr.), £4.

CLASS 24.—6 STOVE or GREENHOUSE FERNS, large specimens, distinct. (Nurserymen.)

1st. Mr. B. S. Williams, £6.

CLASS 25.—2 TREE FERNS, with stems not less than 5 feet high. (Nurserymen.)

1st. Mr. W. Pull, £3.

2nd. Mr. B. S. Williams, £2.

CLASS 26.—2 TREE FERNS, with stems not less than 5 feet high. (Amateurs.)

1st. Withheld.

2nd. Mr. G. Wheeler, £2.

CLASS 27.—6 LARGE PALMS, distinct. (Open.)

1st. J. Warren, Esq. (C. Rann, Gr.), £10.

2nd. Mr. John H. Ley, Royal Nursery, Croydon, £7.

CLASS 28.—20 ROSES, distinct, in pots. (Open.)

1st. Mr. C. Turner, £10.

CLASS 29.—9 ROSES, distinct, in pots. (Nurserymen.)

1st. Mr. C. Turner, £15.

2nd. Messrs. Paul and Son, The Nursery, Cheshunt, £10.

CLASS 31.—COLLECTION OF FRUIT, consisting of 8 distinct kinds. (Open.)

1st. Lord Carington, Wycombe Abbey, High Wycombe (G. T. Miles, Gr.), £10.

2nd. Lord Bagot, Blithfield, Rugeley (T. Bannerman, Gr.), £7.

CLASS 32.—2 PINE-APPLES (Open.)

1st. Her Majesty the Queen, Frogmore, Windsor (T. Jones, Gr.), £2.

2nd. His Grace the Duke of Richmond and Gordon, Goodwood (F. Rutland, Gr.), £1 10s.

CLASS 33.—1 PINE-APPLE. (Open.)

1st. His Grace the Duke of Richmond and Gordon, Goodwood (F. Rutland, Gr.), £1.

CLASS 34.—2 Bunches of BLACK GRAPES. (Open.)

1st. Lord Bagot (T. Bannerman, Gr.), £2.

2nd. Mrs. Tristram, Fowley, Liphook, Hants (P. Edwards, Gr.), £1 10s.

3rd. Earl of Crawford and Balcarres, Haigh Hall, Wigan, Lancashire (A. Jamieson, Gr.), £1.

CLASS 35.—2 Bunches of WHITE GRAPES. (Open.)

1st. Mrs. Tristram (P. Edwards, Gr.), £2.

2nd. Lord Bagot (T. Bannerman, Gr.), £1 10s.

3rd. Earl of Macclesfield, Shirburn Castle, Tetsworth, Oxon (R. Sowerby, Gr.), £1.

CLASS 36.—6 PEACHES, any one kind. (Open.)

1st. L. J. Baker, Esq., Haydon Hall, Eastcote (Jas. Fry, Gr.), £1 10s.

2nd. C. Allhusen, Esq., Stoke Court (J. Maher, Gr.), £1.

3rd. J. L. Lovibond, Esq., Start's Hill, Farnborough, Hants (J. Horwood, Gr.), 15s.

CLASS 37.—6 NECTARINES, any one kind. (Open.)

1st. J. L. Lovibond, Esq. (J. Horwood, Gr.), £1 10s.

2nd. Earl of Macclesfield (R. Sowerby, Gr.), £1.

3rd. W. R. Winch, Esq., North Mymus Park, Hatfield, Herts (J. T. Seymour, Gr.), 15s.

CLASS 38.—2 Dishes of CHERRIES, distinct. (Open.)

1st. Her Majesty the Queen (T. Jones, Gr.), £1.

CLASS 39.—3 Dishes of STRAWBERRIES, distinct. (Open.)

1st. A. Moss, Esq., Chadwell Heath, Essex (J. Worthing, Gr.), £1 10s.

CLASS 40. — 1 Dish of STRAW-BERRIES. (Open.)

- 1st. The Marquis of Salisbury, Hatfield House, Herts (G. Norman, Gr.), 15s.
 2nd. G. Wythes, Esq., Bickley Park, Kent (J. Neighbour, Gr.), 10s.
 3rd. W. Spottiswoode, Esq., Coombe Bank, Sevenoaks (J. Bolton, Gr.), 7s.

CLASS 41.—1 MELON. (Open.)

- 1st. Mr. J. Chilton, The Gardens, Aston Rowant House, Tetsworth, Oxon, £1.

2nd. Lord Carington (G. T. Miles, Gr.), 15s.

3rd. Mr. W. Pepper, the Lodge, Bromley Common, Kent, 10s.

CLASS 42.—Collection of VEGETABLES, consisting of 10 kinds.

- 1st. Lord Carington (G. T. Miles, Gr.), £6.
 2nd. R. B. W. Baker, Esq., Orsett Hall, Romford (W. Iggulden, Gr.), £4.
 3rd. G. D. W. Digby, Esq., Sherborne Castle, Dorset (W. G. Pragnall, Gr.), £2.

Prizes offered by W. Bull, F.L.S., F.R.G.S.

CLASS A.—No Competition.

CLASS B.—12 NEW PLANTS, introduced and sent out for the first time since the commencement of 1875 by Mr. William Bull. (Nurserymen.)

- 1st. Mr. B. S. Williams, a Silver Cup, value £15 15s.

CLASS C.—12 NEW PLANTS, introduced and sent out for the first time

since the commencement of 1875 by Mr. William Bull. (Private Growers.)

- 1st. Mr. C. Rann, a Silver Cup, value £15 15s., and £10.
 2nd. Mr. T. N. Penfold, a Silver Cup, value £10 10s., and £7.
 3rd. Mr. E. Tudgey, a Silver Cup, value £6 6s., and £5.

CLASS D.—No Competition.

Prizes offered by Mr. F. Gallop,

Seedsman and Florist, Brighton, for "Miles's" New Hybrid Spiral Mignonette.

- 1st. Charles Armstrong, Esq., Woodslee, Withdean, Brighton (E. Meachin, Gr.), £10.

2nd. A. Chancellor, Esq., The Retreat Richmond, £7.

3rd. Messrs. Vigor Bros., Withdean Nursery, Brighton, £5.

Special Prize given by Sir Trevor Lawrence, Bart., M.P.

For the Best Specimen Orchid, not a made-up plant, J. W. Miles, Esq.,

Shirehampton, near Bristol (W. Perry, Gr.), £10.

MISCELLANEOUS EXHIBITS, Plants and Flowers.

Messrs. Osborn and Sons, Fulham, S.W., for Stove and Greenhouse Plants and Hardy Herbaceous Plants, Silver Medal.

Mr. H. Boller, 73, South Row, Kensal New Town, N.W., for Cacti, Agaves, Aloes, &c., Bronze Medal.

Mr. W. Bull, Chelsea, S.W., for Group of Plants, Gold Medal.

Messrs. Lane and Son, Great Berkhamstead, for Rhododendrons and Specimen Ivies, Gold Medal.

Messrs. Rollison and Sons, Tooting, S.W., for Group of Plants; Collection of Sempervivums, Echeverias, and Pyrethrums, Gold Medal.

Messrs. Barr and Sugden, 12, King St., Covent Garden, W.C., for Assortment of Alpine Plants; Collections of Sedums, Sempervivums, Saxifrages, Iris, Pyrethrums; Ixias, Sparaxis, Babianas; Cut Flowers of Pæonies, Hemerocallis, Alliums, and Lilies; Silver Flora Medal.

Messrs. Veitch and Sons, Chelsea, S.W., for a Group of Plants, Gold Medal; for a Collection of Ixias, Bronze Medal.

Messrs. Cutbush and Sons, Highgate N., for a Group of New Holland Plants, Silver Medal.

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| <p>Messrs. Downie and Laird, 17, South Frederick Street, Edinburgh, for Pansies, Silver Banksian Medal.</p> <p>Mr. F. Gallop, Brighton, for Miles's New Hybrid Spiral Mignonette, Bronze Banksian Medal.</p> <p>Messrs. Laing and Co., Forest Hill, for a Group of Plants, Silver Flora Medal.</p> <p>Mr. B. S. Williams, Upper Holloway, N., for a Group of Plants, Silver Flora Medal.</p> | <p>Mr. C. Turner, Royal Nurseries, Slough, for 50 pots of Roses, Special Award of the Gold Medal.</p> <p>Messrs. Carter and Co., for a Group of Ornamental Foliage and Flowering Plants, Silver Banksian Medal.</p> <p>Mr. J. Croucher (Gr. to J. T. Peacock, Esq.), Sudbury House, Hammer-smith, W., for a Collection of Succulents, Silver Banksian Medal.</p> <p>Her Majesty the Queen, Frogmore (T. Jones, Gr.), for a Collection of Apples, Silver Medal.</p> |
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Miscellaneous Subjects Connected with Horticulture.

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| <p>Mrs. J. H. Cussons, Southport, for Skeleton Leaves and Flowers, Gold Medal.</p> | <p>Messrs. Radelyffe and Co., 129, High Holborn, W.C., for Rock-work Fernery, Silver Medal.</p> |
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The following Certificates were awarded by the Floral Committee at the Great Show:—

FLORAL COMMITTEE.

First-class Certificates were awarded to Mr. W. Fisher (gardener to F. Williams, Esq.), for *Gloxinia Berkshirei*; to Messrs. G. Jackman and Son, for *Clematis* (double) "*Duke of Connaught*"; to Mr. C. Turner, for *Pelargonium* (show) "*Fortitude*"; to Mr. W. Bull, for *Kentia rupicola* and *Dracena* "*Bijou*." Votes of Thanks were passed to Mr. T. S. Ware, for cut blooms of Pinks, &c., and to G. F. Wilson, Esq., F.R.S., for cut blooms of Liliiums.

JUNE 4, 1878.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice-President, in the Chair.

The Minutes of the last meeting having been read and confirmed, the following candidates for fellowship were duly elected :—Victor Buckley, Lawrence Trent Cave, George P. Craven, Joseph

Davis, Charles Dorman, John Downie, Samuel Edwards, Mrs. Fraser, Charles Godson, William H. Hilton, Lady Huntingfield, Col. F. H. Rich, R.E., J. Rimington, Mrs. Duncan Roberts, Mrs. L. V. Swaine, C. G. Wilkinson, Mrs. Wyman.

Guinea Members.—J. R. Hale and Mrs. Hale.

The awards of the Fruit and Floral Committees were announced, and the Assistant Secretary directed attention to the most interesting plants exhibited.

SCIENTIFIC COMMITTEE

SIR JOSEPH D. HOOKER C.B., Pres. R.S., in the Chair.

Sugar Cane Disease.—The Chairman, in exhibiting a cane which had been sent to him from Porto Rico, said that the communications he had received from various localities on the subject of the Sugar Cane disease were becoming so numerous that scarcely a week passed without fresh correspondence coming to hand on some new or old form of this disease. The present case was being carefully investigated, and a further report would be made hereafter. He added that the specimens sent afforded but little information on this difficult subject.

Mistleto.—Mr. Blenkins exhibited a section of the trunk of a tree showing the roots of Mistleto adhering to the wood. It was observed that none of the roots entered into the wood. Some discussion followed on the best mode of growing this parasite. Mr. Renny observed that a healthy young oak should be selected and the seed placed on the underneath surface of the branches.

Coccus on Rose, &c.—Mr. McLachlan reported that the coccus on the specimen submitted to him for report was *Lecanium rosarum*. It is noticed as especially infesting "Espalier" roses. He had never seen it on "Standards," nor on roses on their own roots. The only remedy is to pick off the affected shoots and burn them. Mr. McLachlan also showed specimens of a gall on the Ash, produced by *Cecidomya botularia*. They were elongated, and in shape and appearance not unlike small sausages. He had never seen them before.

Mucuna Bennetti.—Dr. Bennett showed specimens of this from the Fly River, New Guinea.

Plants Exhibited.—Mr. Elwes showed flowers of *Phytolacca icosandra*, *Gunnera manicata* from Peru; *Xeronema Moorci*, from

New Caledonia ; *Pleione Hookeri* a species which he found on the Sikkim Himalayas, at an elevation of 10,000—11,000 feet, buried in long moss, which was crammed with pseudo bulbs ; it was growing on the horizontal branches of a species of *Rhododendron*.

Skeleton Leaves.—Three cases of “skeletonised” leaves were shown by Mrs. Cussons, of Southport, with the following note :—

“For the dissection of leaves I find the process of maceration too long and tedious, to say nothing of the uncertainty as to the results. I have therefore adopted the use of alkali in saturated solution, the specimens to be introduced while the liquid is heated to boiling point. The time of immersion to be regulated by the character of the various leaves, and the nature of the epidermis to be removed. When the specimen is freed from epidermis and cellular tissue, it must be subjected to the action of chlorine to destroy the colouring matter. The introduction of peroxide of hydrogen serves not only to render the lace-like specimen purer in colour, but preserves it also. In destroying the colouring matter in Ferns this likewise is invaluable ; added to the chlorine it gives a solidity to the bleached fronds, and appears to equalise the action of the chlorine. For skeletonising capsules the slow process of maceration by steeping in rain-water is alone available—a moderate heat may be applied to hasten the process, but alkali is useless.

“Skeletonised leaves and capsules appear to gain in the process a toughness and durability not possessed by them in their natural state.”

Petalody of the Ovules of Cardamine pratensis.—Rev. Geo. Henslow showed specimens in which several of the lower fruits had assumed a globular or ovoid form, and were elevated upon a long gynophore, produced by an elongation of the floral axis above the point of insertion of the other floral whorls. Several had burst on one side, whence issued a mass of small pink petals. On dissecting some of these abnormal ovaries, it was found that the false dissepiment was wanting, but that a large mass of petals had taken the position of the ovules, generally in one chief cluster, forming a miniature “double” flower at the point of attachment to the placenta.

The Native Country of the Potato.—Mr. Hemsley contributed a paper on this subject, pointing out some errors into which M. André had fallen in a recent communication to the *Illustration Horticole*. This communication is published in the Society's Journal.

FLORAL COMMITTEE.

First-class Certificates were awarded to Messrs. J. Veitch and Sons, for *Adiantum cyclosorum*, *Platynerium Hilli*, and *Xeronema Moorei*; to Mr. C. Green (gardener to Sir. G. Macleay), for *Gunnera manicata* and *Lathyrus Drummondii*; to Mr. R. Dean, for *Lathyrus Drummondii*. Votes of Thanks were passed to Mr. H. Boller, for *Othonna crassifolia*; to G. F. Wilson, Esq., F.R.S., and to Mr. C. Green, for cut flowers.

FRUIT COMMITTEE.

A Cultural Commendation was awarded to Mr. W. Allen, for bundle of Asparagus. Commended, Tebbs' Universal travelling pot, from Messrs. Blake and Mackenzie.

WHIT-MONDAY SHOW.

JUNE 10, 1878.

This Exhibition took its rise from a desire on the part of the Council of the Society to provide the poorer classes of the metropolis with a flower show that should be as thoroughly good as it was possible to get together on a Bank Holiday. A liberal schedule, which had been subscribed privately, brought together many creditable exhibits from Covent Garden nurserymen, and some of the regular Exhibitors at the Society's meetings very generously contributed of their floral wealth and artistic skill to afford a display exceeding in value and extent the highest hopes of the promoters. When it is recorded that fine groups were staged by Mr. Wills, Mr. Williams, Messrs. Osborn, Laing, Rollisson, and Lane, it will be understood how rich a treat was provided for the poor people to whom such a sight must have been a real enjoyment. And not the less does it redound to the credit of those gentlemen who so cordially encouraged and supported this popular movement. The number of visitors, at an entrance-fee of twopence, was 15,558.

The Lady Mayoress, who was accompanied by the Rt. Hon. the Lord Mayor, and Mr. Alderman and Sheriff Nottage, visited the Exhibition, and afterwards distributed the prizes to the successful competitors, as follows :—

AWARDS OF THE JUDGES.

CLASS 1.—GROUP of PLANTS arranged effectively, occupying a space not exceeding 300 sq. ft.

- 1st prize £10; Mr. John Reeves, Florist, Acton.
2nd prize £7; Messrs. J. and J. Hayes, Florists, Edmonton.

CLASS 3.—GROUP of 100 SHOW PELARGONIUMS.

- 1st prize £5; Mr. Wm. Brown, Florist, Hendon.
2nd prize £3; Mr. E. Sawyer, Florist, Edmonton.

CLASS 4.—GROUP of 100 ZONAL PELARGONIUMS.

- 1st prize £4; Messrs. J. and J. Hayes, Edmonton.

CLASS 5.—GROUP of 100 FUCHSIAS.

- 1st prize £4; Messrs. J. and J. Hayes, Edmonton.
2nd prize £2; Mr. Wm. Brown, Hendon.

CLASS 6.—FIFTY POTS of MUSK.

- 3rd prize 10s.; Mr. J. Reeves.

CLASS 7.—FIFTY POTS of MIGNONETTE.

- 1st prize £2; Mr. J. Reeves.

CLASS 9.—FIFTY BUNCHES of CUT FLOWERS, to be shown in pots, vases, or glasses.

- 1st prize £2; Mr. J. Reeves.

CLASS 11.—Best filled WINDOW BOX of PLANTS.

- 1st prize £1; Mr. J. Reeves.

3rd „ 10s.; Messrs. Dick Radclyffe, and Co.

CLASS 12.—Six WINDOW PLANTS distinct, best suited for London.

- 2nd prize 15s.; Mr. J. Reeves.

Extra prize to Messrs. Dick Radclyffe, and Co., for effectively arranged flower stand.

Silver Flora Medals to—

Mr. E. Sawyer, Edmonton.

Mr. J. Reeves, Acton.

Messrs. Dick Radclyffe, and Co., High Holborn.

Bronze Banksian Medals to—

Mr. W. Bromage, 6, Charles Street, Kensington.

Mr. J. Cornish, Great Tower Street.

AMATEUR ARTISANS, &c.

CLASS A.—Best Exhibition of PLANTS grown in the City of London.

- 1st prize, £2, and the Society's Silver Medal; Mr. R. Oastler, 17, Sun Street, Finsbury.
2nd prize, £1, and the Society's Bronze Medal; Miss M. J. White, 25, Earl Street, Finsbury Square.
3rd prize 10s.; Mr. J. F. Jarvis, Guildhall.

CLASS B.—Best Exhibition of PLANTS grown within a Radius of General Post-Office.

- 1st prize, £2, and the Society's Silver Medal; Mr. T. Smart, 41, Arthur Street, Chelsea.
2nd prize, £1, and the Society's Bronze Medal; Miss D. Harroway, 34, Arthur Street, Chelsea.
3rd prize 10s.; Mr. J. Onslow, 6, Charles Street, Kensington.
Extra prize 5s.; Mrs. Linington, 20, King Street, Chelsea.

CLASS C.—Best SINGLE WINDOW PLANT grown for more than twelve months, within a radius of five miles of General Post-Office.

- 1st prize, £1, and the Society's Silver Medal; Mr. W. Morgan, 1, Omega Terrace, King's Road, Chelsea.
2nd prize, 10s., and the Society's Bronze

Medal; Mr. J. Sharpe, 13, Marlboro Street, Chelsea.

- 3rd prize 5s.; Mr. J. Stanley, 29, Gale Street, Chelsea.

CLASS D.—Best Collection of WILD FLOWERS, to be shown in separate bunches, to be competed for by Children attending the various Public and Elementary Schools.

- 1st prize, £1, and the Society's Silver Medal; Mr. C. Schlee, 93, Alexandra Cottage, Penge.

CLASS E.—Best Bunch of WILD FLOWERS, to be competed for by Children attending the various Public and Elementary Schools.

- 1st prize, £1, and the Society's Silver Medal; Mr. A. M. Brown, Hawthorn Cottage, Hendon.
2nd prize, 10s., and the Society's Bronze Medal; Mr. H. Schlee, 93, Alexandra Cottages, Penge.

CLASS F.—Best arranged Vase or Stand of WILD FLOWERS.

- 1st prize, £1, and the Society's Silver Medal; Mr. A. J. Squire, 8 Merton Road, Kensington.
2nd prize, 10s., and the Society's Bronze Medal; Miss Fanny Schlee, 93 Alexandra Cottages, Penge.

Offered by Messrs. Sutton and Sons, Reading.

CLASS G.—Best Collection of VEGETABLES.

1st prize £1 1s.; Mr. T. Smart, 41, Arthur Street, Chelsea

MISCELLANEOUS.

Extra Prizes.

Mr. J. Wills, South Kensington; Group of Plants; Gold Medal.	Messrs. John Laing and Co., Forest Hill; Group of Plants; Silver Banksian Medal.
Messrs. W. Rollisson and Sons, Tooting; Group of Plants; Silver Banksian Medal.	Mr. H. Boller, Kensal New Town Collection of Agaves and Miniature Succulents; Bronze Banksian Medal.
Messrs. Osborn and Sons, Fulham; Group of Plants; Silver Banksian Medal.	Messrs. F. and A. Smith, Dulwich; Group of Plants; Bronze Banksian Medal.
Mr. B. S. Williams, Upper Holloway; Group of Plants; Silver Banksian Medal.	Mrs. Brown, Hendon; Specimen Fern; Bronze Banksian Medal.

JUNE 18, 1878.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice President, in the Chair.

The Minutes of the last meeting were read and signed.

Elections.—James M. Francis and H. Pearks.

The Assistant Secretary announced the awards of the Committees, and referred to some of the principal objects of interest in the Show.

Upon this occasion was held the Annual Exhibition of the Pelargonium Society, which brought together a most brilliant display. The Society's Exhibition of Cut Roses held this day was also very successful.

SCIENTIFIC COMMITTEE.

SIR JOSEPH D. HOOKER, C.B., Pres. R.S., in the Chair.

Sugar Cane Disease.—Mr. Renny stated that he had examined the specimens of diseased sugar cane shown at the last meeting, and had been unable to find any trace of fungus.

Polyporus sulphureus.—Dr. M. F. Masters, F.R.S., on behalf of Mr. Miles, The Gardens, Wycombe Abbey, showed a fine specimen. Dr. Cook remarked that crystals of oxalate of lime

were found in abundance upon this fungus and appeared on the surface as a greyish incrustation.

Potato leaves marked with warts.—Dr. Masters showed from Mr. A. Dean leaves of Potatos the under surfaces of which were marked with warts similar to those which occur on Vine leaves when grown in too close and moist an atmosphere. The conditions under which the Potatos were grown were such as would be likely to produce the growths in question.

Phytoptus tilia.—Mr. McLachlan showed specimens of the nail or horn-like galls produced by *Phytoptus tilia*.

Miscellaneous Exhibits.—Dr. Masters showed a specimen of *Ophrys fucifera* from Folkestone, in which the perianth and ovary were normal, but the column was represented by three superposed segments, each with indications of an anther on its margins. Dr. Masters also showed specimens of *Orobanche caryophyllacea*, *O. picridis*, *Silene nutans*, and other rare species, from the Folkestone cliffs.

Donations to the Lindley Library.—The Assistant Secretary announced the presentation to the Lindley Library of the tenth volume of Baron Von Muller's "Fragmenta" by the Government of Victoria, and of the third edition of Henfrey's "Elementary Course of Botany," by Dr. Masters.

FLORAL COMMITTEE.

First-class Certificates were awarded to Messrs. J. Laing and Co., for *Begonia* "*Calypso*"; to Messrs. T. Cripps and Sons, for *Clematis viticella* "*Earl Beaconsfield*"; to Mr. W. Bull, for *Dracæna vivicans*; to Messrs. W. Paul and Son, for *Rose* (H.P.) "*Countess of Rosebery*"; to Mr. H. Cannell, for *Dactylis elegantissima aurea*; to Dr. J. Denny, for Zonal Pelargoniums, "*Manfred*," "*Sunbeam*," "*Madonna*," and "*Titania*"; to Messrs. W. Rollisson and Sons, for *Erica obbata expolita*; to Mr. C. Noble, for *Rhododendron* "*The Tocsin*"; to G. F. Wilson Esq., F.R.S., for *Lilium Hansonii*; to Mr. C. Turner, for Fancy Pelargoniums, "*Placida*," "*Insulaire*," and "*Janette*"; and Show Pelargoniums, "*Bertie*" and "*Amethyst*"; to E. B. Foster, Esq., for Show Pelargoniums, "*Marmion*," "*Invincible*," "*Symmetry*," "*Dauntless*," and "*Criterion*"; to Mr. J. Catlin (gardener to Mrs. Lermite), for Zonal Pelargonium "*Fanny Catlin*"; to Messrs. E. and J. Perkins, for *Potentilla* "*Prince Arthur*." Highly Commended, *Cypripedium spectabile*,

from Rev. A. Rawson. Commended (for strains), Canterbury Bells, from Mr. R. Dean; and Striped Petunias from Mr. J. Marchant. Votes of Thanks were passed to Mr. R. Dean, for cut blooms of Canterbury Bells; to Mr. C. Noble, for cut blooms of Rose "*Queen of Bedders*"; to Rev. A. Rawson, for cut blooms of Lilies and Irises; and to Sir W. C. Trevelyan, for Carnation "*Souvenir de la Malmaison*."

FRUIT COMMITTEE.

A First-class Certificate was awarded to Messrs. Thos. Rivers and Son, for Peach "*Hale's Early*," and a Cultural Commendation for a fine Collection of Fruit Trees in bearing. Votes of Thanks were passed to Mr. G. Lee and Mr. J. Lane (gardener to Lieut.-General Fytche), for dishes of Strawberries; also to Mr. W. Hind (gardener to Sir T. Edwards-Moss), for Strawberries and Tomatos; and to Messrs. T. Rivers and Son, for dishes of Peaches.

JULY 2, 1878.

ORDINARY GENERAL MEETING.

WILLIAM HAUGHTON, Esq., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Elections.—H. Boller, T. Rowley Hill, M.P., Henry G. S. Williams.

Guinea Member Admitted.—A. F. Godward.

The Awards of the Committees were announced.

SCIENTIFIC COMMITTEE.

SIR JOSEPH D. HOOKER, C.B., Pres. R.S., in the Chair.

Propagation of Primroses.—The following letter from Mr. I. Anderson Henry was read:—"I have observed a very singular means by which Primulas may easily be propagated to any extent, and it strikes me that if it be unknown it might be worth communicating. I had raised from seeds sent me from Ladak and Kashmir a great many of the tribe, and as I could not accommodate them under glass, I caused them to be planted out in beds of the *P. denticulata* type, and principally I believe they were true *P.*

purpurea. Having stood the winter, and having occasion for the beds last spring, I caused them to be dug up and removed. I filled up their space with other more prized things, and amongst these I now find the Primulas were coming up like weeds. I find in digging them up that fibrous roots had been cut off, and from these have sprung the numerous progeny I now have to remove as weeds. Is not this an unmistakable hint how to propagate the tribe by the million for the million?"

Tea Disease in Sikkim.—Leaves of the Tea plant affected with some insect supposed to be red spider were sent from Darjiling—where the prospects of the crop are seriously injured—through Mr. Caird, C.B., with a request for information. Opinions were expressed to the effect that the damage in question was not caused by a spider at all, but appeared to be a species of fungus life. The specimens were referred to Mr. McLachlan for investigation and report.

Diseases of the Vine.—Dr. M. C. Cooke read a fifth communication on Vine diseases, which will appear *in extenso* in the Journal of the Society.

Acer Schwedleri.—Dr. Masters showed leaves of this, commenting on its beauty as an ornamental tree, and pointing out the singular inclination of the petiole to the blade of the leaf.

Flints and Lichens.—Mr. W. G. Smith exhibited a series of worked implements and flakes of flint from the Sussex Downs. In every instance where the original crust of the flint had been left untouched there was on that spot a growth of lichens, principally *Lecanora pallida*, but wherever a flake had been struck off by the pre-historic makers the worked face and the detached flake were alike perfectly plain or only showed rudimentary vegetation. Mr. Smith said that in damp situations under trees, or when flints were embedded in abundant mortar, the lichens might temporarily creep over a worked surface, but they could not maintain their position or perfect themselves as they invariably did on the old natural crust. To show the almost indestructible character of flint Mr. Smith exhibited a Palæolithic celt from the drift gravel, which showed a large thick snowy-white patch of the original crust on the butt-end just as it was left ages ago by the maker, the worked portion of the flint showing its original black colour where no decomposition whatever had place.

Hybrid Lilies.—Mr. G. F. Wilson showed on behalf of Mr. Mangles, of Haslemere, a noble Lily, like croceum in general aspect

—the anthers were quite barren; also a supposed hybrid variety of *L. philadelphicum* or of *pulchellum*, from Messrs. Veitch. Two varieties of *L. pardalinum* were shown, var. *Robinsoni* with large flowers, and var. *Californicum* with small flowers somewhat glaucous in the centre.

Vitality of Seed.—Rev. G. Henslow showed some seeds of *Guilandinia Bonducella*, they were twenty years old. He had taken some to Hendon, and having been sown, some of them germinated, and a plant now in Messrs. Henderson's Nursery is 3 feet in height. Conversation ensued on the vitality of seeds, in the course of which Dr. Masters mentioned that he had found seeds upon the Cornish coast actually germinating in the salt water. The Chairman remarked that many trees and plants had been introduced from one island to another by means of seed which had drifted on the surface of the ocean.

The Assistant Secretary announced that the following donations had been received for the Lindley Library, viz.:—"Life of Alfred Smee," by the Authoress; "Forest Flora of British Burmah" (Kurz), from the Government of India; "Flora Australiensis," vol. vii. (Prof. Bentham), from the Author; "Proceedings of the American Philosophical Society," vol. xvii., No. 100; "Report of the Geological Exploration of the Fortieth Parallel," by the Engineers' Dept., U.S. Army (vol. iv.).

FLORAL COMMITTEE.

First-Class Certificates were awarded to Mr. C. Turner, for H. P. Roses, "*Penelope Mayo*" and "*Dr. Sewell*"; to the New Plant and Bulb Company, for *Freesia refracta*, var. *alba*; to Messrs. Wm. Paul and Son, for Rose (H. P.) "*Duchess of Bedford*"; to Mons. V. Lemoine, for Pelargoniums (ivy-leaved) "*Elfrida*" and "*Lucie Lemoine*." Highly Commended: Cape Pelargoniums, from Mr. J. Pearson. Commended (for Strains): Petunias, from Mr. G. Smith; Sweet Williams, from Mr. R. Dean. Cultural Commendation to Mr. H. Heims (gardener to F. A. Philbrick, Esq., Q.C.), for *Cattleya gigas*. Votes of Thanks were passed to G. F. Wilson, Esq., F.R.S., for cut blooms of Lilies; and to Mr. H. Cannell, for cut blooms of Verbenas.

FRUIT COMMITTEE.

First-Class Certificates were awarded to Mr. J. Dell, for Melon "*Dell's Hybrid*"; to Mr. R. Gilbert (gardener to the Marquis

of Exeter), for Melon "*Netted Victory*." A Vote of Thanks was passed to Mr. H. A. Mann (gardener to Mrs. Hornsby), for Melons and Nectarines.

JULY 10TH, 1878.

PROVINCIAL EXHIBITION AT PRESTON.

After an interval of five years, during which period no Horticultural Exhibition had been held under the Society's patronage in the provinces—the last having been at Bath in 1873—a show upon an extensive scale was organised to be held at Preston in Lancashire. A local committee, presided over by the Mayor of Preston, was formed, and Mr. T. M. Shuttleworth, late a member of the Council of the Society, undertook the duties of honorary secretary.

The occurrence of the operatives strike in the early part of the year exercised, unfortunately, a somewhat unfavourable influence upon the exertions of the local Committee, and considerable difficulty was experienced in raising an adequate subscription list, and at one period the feeling was general in London that the most prudent course would be to postpone the Exhibition for the present. The earnest representations of the local Committee, who sent a deputation of their own body to London to urge their wishes upon the Council, were, however, pressed upon the Society not to abandon the Show, and the arrangements were allowed to proceed, and the Exhibition was accordingly held on the 10th July and the following days. The inauguration ceremony was attended by the Right Hon. Lord Aberdare, the President of the Society, and several members of the Council, the Mayor and Town Council of Preston receiving them as visitors. Unfortunately the weather was not favourable, and the attendance was only limited.

The display of valuable plants was extensive, and the groups of stove and greenhouse plants were amongst the best that had ever been seen in this country. Orchids and ornamental foliage plants were well represented, and of specimen Ferns several highly interesting collections were exhibited. The entire Show was on a scale, and of a quality that fully sustained the reputation of the Society's provincial exhibitions.

The entries for fruit were tolerably good, especially in competition for Messrs. Jas. Veitch and Sons special prizes. Some remarkably fine Peaches, Nectarines, and Strawberries were shown.

Of vegetables, there was a good display, both in the Open and in the Cottagers and Artisans Classes.

The exhibition of horticultural buildings and appliances was very complete and extensive, and manifested considerable advance in elegance of design and lightness of structure, combined with many valuable practical improvements.

From a horticultural point of view the Preston Exhibition will rank amongst the best that have ever been held under the auspices of the Society.

JULY 23, 1878.

ORDINARY GENERAL MEETING.

COLONEL R. TREVOR CLARKE, Vice-President, in the Chair.

The Minutes of the last Meeting were read and signed.

Elections.—Mrs. Thomas Dent, Charles J. Dimond, Mrs. Bolton King.

The Awards of the Fruit and Floral Committees were announced, and the Assistant Secretary addressed the Fellows present on the subject of Carnations and Picotees, and other interesting plants shown. Upon this occasion was held the Annual Show of the Carnation and Picotee Society, which added considerable attraction to the Meeting.

SCIENTIFIC COMMITTEE.

DR. MAXWELL T. MASTERS, F.R.S., V.P., in the Chair.

Tea-Leaf Disease. — Mr. McLachlan reported that he had examined the leaves which had been referred to him at a previous meeting. They had evidently been put into a book, pressed and dried; they appeared to have been punctured by some insect, but it was impossible to say by what. It might be the red spider, but

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it was almost useless to send specimens in such a condition. As a remedy, some preparation of sulphur might be tried.

Injury to Pines.—Mr. McLachlan showed specimens of Pines (*P. sylvestris*), the young shoots of which were matted and felted together by a white web, the work of a species of Tortrix. The injury was spread over so large an area that hand-picking and other means of combating the evil were ineffectual. Mr. McLachlan also exhibited a moth which he had bred from one of these larvæ. It was a variety of *Pedisea occultana*.

Sugar-cane Disease.—Specimens were again shown from Porto Rico, in which the cane was bored by some insect; but in the total absence of all history of the invasion, and in the absence of specimens of the insect, no more definite opinion could be given. The cane had been split in every direction in the hope of finding some beetle, but without success. The larvæ of some species allied to the Cockchafer had been found in the tubs, but it was impossible that the beetle from this larva could emerge from the small holes in the cane.

Virginian Creeper.—Mr. W. G. Smith exhibited a drawing of a bottle containing water and a plant in the grasp of a tendril of *Ampelopsis hederacea*. Mr. Smith said that on one of the walls of his house he had a large Virginian Creeper growing, and a week or two ago he noticed, when the hanging branches were disturbed by the wind, that there was a jingling noise against the wall near one of the first floor windows. On going to the spot to discover the cause of the noise, he found a bottle tightly grasped round the neck by a tendril of the *Ampelopsis*. The bottle, which contained water and a specimen of *Phyteuma orbiculare*, weighed just over three ounces. It had been taken by the Creeper off the sill of a window above, and lowered (as the branches grew downward) several feet, nearly to the level of the window below.

Juice distilled by Polyporus dryadeus.—Mr. Smith showed a phial containing the juice naturally distilled by this woody Fungus from the trunk of the Oak. *P. dryadeus* is a not uncommon parasite of the Oak, and it is invariably studded with large drops of moisture near the margin of its pileus. The moisture is derived from the tree on which the Fungus grows. The juice, which was obtained by Dr. Bull of Hereford, was, said Mr. Smith, sweet to the taste, and probably devoid of tannin; on a microscopical examination it displayed a number of germinating spores, a few crystals, some cells belonging to the Fungus; and a number of

exceedingly minute revolving bodies, which might be referred to *Sphæro-bacteria*, though the nature of these latter bodies might possibly be of a very different character from *Bacteria*.

Potato Disease.—Rev. G. Henslow exhibited specimens showing the carbonising effect of the Fungus on the leaves.

Hybrid Lilies.—Mr. G. F. Wilson showed specimens of hybrid Lilies raised by Mr. Mangles. The flowers were in the way of those of *L. croceum*, with large bell-shaped flowers, lanceolate recurved segments, tapering at the base into a stalk, and of a buff-yellow colour spotted with purple spots. No anthers were formed.

Gnaw on Cedar.—Mr. Wilson also showed a good specimen of these productions, which are usually considered to be abortive branches.

Monstrous Forms of Mimulus maculatus.—Specimens were sent by Mr. Clapham, which were referred to Dr. Masters for examination and report. The chief peculiarity in these flowers was the existence of three, four, and five separate carpels in place of the two combined ones usually formed. Assuming the typical number to be five these specimens exhibited a reversion to the type.

Diseased Orchid Leaves.—Dr. Masters showed, on behalf of the Marquis Corsi-Salviati, leaves of *Aerides odoratum*, &c., with a corky development of the epidermis, the result of some injury to the leaves. As sundry Cocci or scale insects were present, the presumption was that the insects in question were the cause of the malady. The specimens were referred to Mr. McLachlan for further report.

Monstrous Rose.—Dr. Masters showed a specimen, obtained from the Royal Gardens, Kew, of a Rose, in which the shoot was flattened, curved, and bore flowers on one side only, one above another in continuous series. The specimen was remarkable as affording an excellent illustration of the growth and union of secondary axes, one to the other, in a continuous line, as in the so-called "*sympodes*." An excellent sketch of the shoot in question was exhibited by Mr. Worthington Smith.

Torenia Bailloni.—Dr. Masters called attention to this remarkable novelty from Cochin China. It has the habit of *T. asiatica* and of *T. Fournieri*, but the flowers are bright yellow with a dark purplish-brown tube. The specimen was exhibited by Messrs. Veitch before the Floral Committee, but as the plants were small and out of condition, no notice was taken by that body of what is a very interesting novelty and one which ultimately is sure, in all probability, to find favour with cultivators. Some conversation ensued as to the desirability of the Scientific Committee taking

steps to adjudicate on novelties and plants of botanical interest likely to be passed over by the other committees, either because not adapted for decorative or commercial gardening, or because they are not exhibited in a condition to justify any notice being taken of them on the grounds of cultivation. Numbers of interesting plants, and some, like the present one, pretty certain to secure the favour of cultivators in general, might be sent if they were not likely to be ignored by the Floral Committee. A "botanical certificate" given by that body is naturally as little valued as a "first-class certificate" awarded to a florist's flower by the Scientific Committee would be.

Specimens Exhibited.—Mr. W. W. Saunders sent from Worthing, as illustrating the mild winter climate of that locality, *Colletia spinosa* in fruit, *Hakea adnata* in fruit, *Verbena Melindres*, and *Cnicus altissimus*, a noble Thistle, 11 feet high, 7 feet through at 4 feet from the ground. The whole plant has a pyramidal habit like that of a Cypress, and is very ornamental. A plant of Pelargonium "*Vesuvius*," in which the white sport had reverted to its original red, the white and the scarlet flowers being produced on the same stem, was shown by Mr. Cannell.

Lindley Library.—Donations were announced from Messrs. Veitch of a copy of the original edition of Gerarde's "*Herbal*" (1633), and of Le Blond's "*La Théorie et la Pratique du Jardinage*," 1715. Mr. Ellacombe's work on the "*Plants of Shakespeare*" has been added by purchase.

FLORAL COMMITTEE.

A First-Class Certificate was awarded to Mr. C. Turner, for H. P. Rose, "*Harrison Weir*." Cultural Commendation to Mr. T. Speed (gardener to the Duke of Devonshire, K.G.), for *Disa grandiflora*. Votes of Thanks were passed to Messrs. J. Veitch and Sons, for *Celosia pyramidalis* and *Olearia Haastii*; to Messrs. F. and A. Smith, for a Collection of Balsams; to Sir W. Marriott, for *Disa grandiflora superba*; to Lady Dorothy Nevil, for Cockscombs; to G. F. Wilson, Esq., F.R.S., for *Lilium superbum*; and to Mr. C. Smith, for *Sparaxis pulcherrima*.

FRUIT COMMITTEE.

A Cultural Commendation was awarded to Messrs. T. Rivers and Sons, for Peaches, Nectarines, and Cherries. Votes of Thanks were passed to Mr. J. Clark, for a Collection of Melons; and to Messrs. C. Lee and Son, for "*Lawton*" Blackberry.

AUGUST 6, 1878.

ORDINARY GENERAL MEETING.

WILLIAM HAUGHTON, Esq., in the Chair.

THE Minutes of the last Meeting were read and signed.

Elections.—James Derham, Sir Henry W. Gordon, K.C.B., Charles Kilmister, John Southgate.

The Assistant Secretary announced the Awards of the Fruit and Floral Committees, and called attention to a few of the more prominent objects of interest exhibited. The special feature of that day's Meeting having been Tuberous Begonias, of which several important collections were shown, Mr. Jennings remarked upon the history and wonderfully rapid development of this now favorite plant. He said that till within the last dozen years Begonias had been popularly known as ornamental-leaved plants, of which *B. Rex* was the most familiar type; there were several species in cultivation, but none were remarkable for their flowers until Messrs. Veitch and Sons received from their traveller, Mr. Pearce, the brilliant *B. Veitchii*, a native of Bolivia, in South America, a low-growing, stemless species, but throwing its conspicuous scarlet flowers well above the little tuft of roundish leaves. This was followed by *B. rosaflorea*, specifically almost identical with the former, but having white flowers, deepening sometimes into pale rose. The discovery of *B. boliviensis* furnished a new feature, for in addition to its bright scarlet flowers, this species has a fine erect habit, branching stems, and graceful foliage. A novelty in colour had been found in *B. Pearcei*, with its clear yellow flowers, and all these new species being natives of the high mountainous regions of Peru and Bolivia, were soon proved to be almost hardy.

With the above materials the hybridists had had a grateful task, and innumerable garden varieties had been raised, exhibiting every possible shade and combination of tint between scarlet, yellow, and white.

M. Lemoine, of Nancy, had raised many interesting hybrids, and amongst them some with partly double flowers; that was of course a monstrosity, in which the stamens had developed

into petals more or less perfectly. The true form of Begonia is recognised in staminate flowers with four petals, and in pistillate flowers with five, though this is by no means constant.

Tuberous Begonias were best raised from seed sown early in the year; the seedlings would with care be flowering in the month of June or July, and would continue in bloom well on into the cold weather. If grown in the open border they should be lifted in September and transferred to pots, where they will continue to bloom indoors. A few varieties have been known to retain their vitality out of doors all the winter. The tubers are very small, and being just the color of the earth are very likely to be lost. The soil that suits them best is a light, friable sandy loam; they are impatient of damp, but will stand heavy rain and powerful sunshine better than Scarlet Pelargoniums. He believed that the popularity of this charming genus would greatly increase when its useful and ornamental qualities become better known.

FLORAL COMMITTEE.

Medals Awarded.—Small Gold Banksian Medals to Messrs. J. Veitch and Sons, for their group of plants; to Messrs. J. Laing and Co., for group of Begonias; to Messrs. Kelway and Sons, for collection of Gladioli. Silver Banksian Medals to Mr. B. S. Williams and Messrs. Hooper and Co., for their groups of plants.

First-class Certificates were awarded to Messrs. J. Laing and Co., for Begonia "*Mrs. Dr. Todd*"; to Messrs. Kelway and Co., for Gladioli "*Herois*," "*Gorgonius*," and "*Telamon*"; and to Begonia "*Chiswick Blush*," raised at the Society's gardens at Chiswick. Botanical Commendations were awarded to "*Torrenia Bailloni*," from Messrs. J. Veitch and Sons, and to "*Dendrobium D'Albertisii*" from Mr. B. S. Williams. A vote of thanks was accorded to Mr. H. Cannell for cut blooms of Pelargoniums and Verbenas.

FRUIT COMMITTEE.

Medal Awarded.—Silver Knightian to Mr. S. Ford (gardener to W. E. Hubbard, Esq.), for collection of Potatos.

Cultural Commendation to Mr. W. Thomson, of Clovenfords, for a remarkable bunch of "*Duke of Buccleuch*" Grape; also

to a large collection of Cabbages from the Society's Garden at Chiswick. Votes of thanks were passed to Messrs. C. Lee and Son, for the "*Lawton*" Blackberry, and to Mr. S. Ford for collection of Potatos.

AUGUST 20, 1878.

FLORAL COMMITTEE.

First-class Certificates were awarded to Mr. B. S. Williams, for *Croton Williamsii*; to Mr. C. Turner, for Dahlias "*Helen Macgregor*" and "*Prince Bismarck*"; to Messrs. J. Veitch and Sons, for *Cattleya Veitchiana*; to Mr. Mitchell (gardener to Dr. Ainsworth), for *Cattleya Mitchellii*. A Botanical Certificate to Mr. H. J. Clayton, for *Blechnum interruptum*. Cultural Commendation was voted to Mr. B. Johnson (gardener to T. T. Clarke, Esq.), for seedling Vallotas in flower; and Votes of Thanks were passed to Mr. R. S. Yates, for a magnificent spike of *Lilium auratum*; to Sir Trevor Lawrence, Bart., for specimens of *Odontoglossum Reichenheimii* and *Dendrobium MacCarthiae superba*; to Mr. H. Cannell, for cut Verbenas; to Mr. C. Green (gardener to Sir George Macleay), for cut flowers; and to G. F. Wilson, Esq., for cut flowers of *Lilium Lishmanni* and *Lilium speciosum rubrum*.

FRUIT COMMITTEE.

A First-class Certificate was awarded to Mr. F. N. Dancer, for Plum "*River's Sultan*," and Votes of Thanks to Mr. Dancer, for a collection of Plums, and to Messrs. W. Paul and Son, for a collection of early Apples.

SEPTEMBER 17, 1878.

ORDINARY GENERAL MEETING.

JOHN DENNY, Esq., M.D., in the Chair.

The Minutes of the last meeting were read and confirmed.

The Assistant Secretary announced the Awards of the Fruit and Floral Committees, and commented upon several of the

interesting plants shown. Mr. H. J. Elwes remarked upon a group of *Lilium neilgherrense*, exhibited by Mr. Bull, and directed attention to the fine sample of Vanilla pods grown at Syon House.

FLORAL COMMITTEE.

First-class Certificates were awarded to Mr. J. Keynes, for Dahlia "*Aurora*"; to Mr. Bull, for *Macrozamia cylindrica*; to Messrs. Rawlings Brothers, for Dahlia "*Clara*"; to Mr. C. Turner, for Dahlia "*Joseph Ashby*"; to Messrs. Hooper and Co., for Begonia (double) "*Louis Thibaut*"; to Messrs. J. Laing and Co., for "*Eulalia japonica zebrina*"; to Mr. C. Green (gardener to Sir Geo. Macleay), for *Nelumbium luteum* as a fine foliaged plant; to Mr. H. Cannell, for Dahlias (single) *lutea* and "*Paragon*" as decorative flowers; also to Begonia "*Nellie May*," raised in the Society's Garden at Chiswick. A Second-class Certificate was awarded to Mr. J. Keynes, for Dahlia "*Gaiety*." Votes of Thanks were passed to Mr. W. Bull, for a group of *Lilium neilgherrense*; to Messrs. Rawlings Bros., Mr. Geo. Smith and Mr. J. Keynes, for cut blooms of Dahlias; to Mr. C. Noble, for *Gyneryum argenteum pumilum* and cut blooms of Rose "*Queen of Bedders*"; to Messrs. Hooper and Co., for a group of double Begonias; to Mr. C. Green, for *Brunsvigia Josephina*, *Costus speciosus* and *Gloxinia maculata*; to Mr. H. Cannell, for cut blooms of Verbenas, Marigolds and Dahlias; and to Mr. J. F. Mould, for cut blooms of Verbenas.

FRUIT COMMITTEE.

A First-class Certificate was awarded to Messrs. T. Rivers and Son, for Pear "*Dr. Hogg*," and Cultural Commendation to Mr. J. Walker, for Onions; and to Mr. J. Woodbridge (gardener to the Duke of Northumberland), for *Vanilla planifolia*. Votes of Thanks were passed to Messrs. T. Rivers and Son, for a collection of Fruit; and to Mr. D. Abbott (gardener to C. H. Firth, Esq.), for Peas and Tomatos.

OCTOBER 15, 1878.

ORDINARY GENERAL MEETING.

COLONEL R. TREVOR CLARKE, Vice-President, in the Chair.

The Minutes of the last meeting were read and signed.

Elections.—W. Bradley, A. Campbell, J. Cocker, Mrs. Cockerell, L. B. Lamb, E. J. Laumonier, R. J. Maxwell, Mr. T. J. Mills, E. J. Poynter, R.A., and R. Sturgis.

The Assistant Secretary read the awards of the Fruit and Floral Committees and directed attention to the splendid collection of dwarf hardy ornamental evergreens displayed by Messrs. James Veitch and Sons, in the Vestibule, embracing nearly a hundred varieties—the most complete exhibition of the kind that had ever been seen. Mr. Jennings also alluded to the fine specimen of *Vanda carulea*, bearing 87 flowers upon five spikes, shown by Mr. W. Smith (gardener to C. Lane, Esq.), and said that he had met with this Orchid on the Khassia Hills, at an altitude of about 4,000 feet, where it seems to delight in full exposure to the sun; it is very local, and is often found growing on the decaying stumps of dead trees. *V. carulea*, together with *V. cristata* and *V. Cathcartii*, will take cooler treatment than the *Vandas* of the Straits and Java. He also remarked upon the fine collections of Orchids exhibited by Messrs. Bull, Veitch, and Williams, amongst which were several new and interesting specimens, *Phalanopsis esmeralda*, from Cochin China, quite unlike any other species, with an upright spike of pretty rosy flowers. *P. violacea*, exhibited for the first time in flower; the spike was at present a small one, but doubtless when the plant had become established, it would prove a valuable acquisition.

Alluding to the labours of Messrs. Dominy, Seden, and others, whose experiments in effecting the hybridization of Orchids were now giving such wonderful results, Mr. Jennings said, that at this meeting there were no less than four new hybrid Orchids, *Cypripedium vexillarium*, with a very broad and noble upper sepal—a cross between *C. Farreanum* and *C. barbatum*; *Cypripedium albo purpurea*, between \times *C. Dominii* and *C. Schlimii*; *Cypripedium marmarophyllum*, between *C. Hookeri* and *C. barbatum*, with very handsome foliage; and *Cattleya Mastersonii*, a cross between a seedling and

C. labiata. There were also in the room three or four very distinct varieties of the North Australian *Dendrobium bigibbum*; some flowers were very deep purple in colour, others pale rosy with a white streak in the labellum, and Mr. Williams' charming *D. bigibbum album*, a striking novelty, was pure white.

Mr. Elwes made a few observations on a specimen of *Bomarea Jacquiniana*, shown by Mr. Green, bearing forty-eight flowers on one panicle, a perfect floral chandelier. He said it should be grown in strong loam, well manured, and kept cool it would flower all the summer.

FLORAL COMMITTEE.

Large Gold Banksian Medals were awarded to Messrs. James Veitch and Sons, for a group of dwarf ornamental Shrubs for winter bedding, &c.; and to Mr. B. S. Williams, for a group of fine foliage and flowering Plants; a small Gold Banksian to Mr. W. Bull, for group of Orchids and new and rare Plants; a Silver Banksian to Messrs. Osborn and Sons, for group of fine foliage and flowering plants; Silver Flora Medals to Mr. R. Parker, for a collection of cut flowers of hardy plants; and to Messrs. Wm. Paul and Son, for cut Roses and cut sprays of pictorial trees and shrubs, illustrating the beauty of autumnal tints.

First-class Certificates were awarded to Messrs. James Veitch and Sons, for *Anthurium Scherzerianum album* and *Lastrea aristata variegata*; to Mr. L. T. Davis, for *Pernettya mucronata lilacina*; to Mr. W. Bull, for *Bomarea Carderii*; *Aspidium crinitum* and *Lastrea aristata variegata*; to Mr. C. Green (gardener to Sir G. Macleay), for *Bomarea Carderii*; and to Mr. H. Boller for *Mamillaria sphacelata*.

Botanical Commendations were awarded to Messrs. J. Veitch and Sons, for *Phalenopsis violacea*; and to Mr. W. Bull, for *Masdevallia velifera*.

Cultural Commendations were awarded to Hemsley's "Improved Giant Hybrid" Mignonette, from the Society's Gardens, Chiswick; and to Mr. C. Green, for *Bomarea Carderii*.

Votes of thanks were passed to Thos. Moore, Esq., F.L.S., for cut blooms of Single Dahlias; to Mr. C. Green, for *Aster Drummondii*, *Pyrethrum uliginosum* and *Helianthus orgyalis*; to Miss E. Regel, for Drawings of plants; to Messrs. Hooper and Co., for group of Gesnerias, &c.; and to Messrs. J. Laing and Co., for group of Begonias.

FRUIT COMMITTEE.

A small Gold Banksian Medal was awarded to Messrs. H. Lane and Son, for a collection of Grapes; Silver Knightians to Mr. G. T. Miles (gardener to Lord Carington), for specimens of Pine Apple "*Lord Carington*," and to Mr. G. Goldsmith (gardener to P. Hardwicke, Esq.), for collection of Pears.

Silver Flora to Mr. G. Sage (gardener to Earl Brownlow), for a pot Vine grown for table decoration.

A First-class Certificate was awarded to Apple "*Baumann's red Winter Pearmain*," from the Society's Gardens, Chiswick.

Cultural Commendations were awarded to Mr. J. H. Goodacre (gardener to the Earl of Harrington), for 6 Bunches of Grape "*Lady Downes*"; to Mr. R. Dean, for collection of Potatos; to Harrison Weir, Esq., for Grape "*Champion Muscat*"; to G. F. Wilson, Esq., F.R.S., for Pear "*Doyenné du Comice*," from a pot-tree; to Mr. J. Maulden (gardener to J. S. Budgett, Esq.), for two "*Smooth Cayenne*" Pine Apples; and a collection of Grapes, from the Society's Gardens, Chiswick.

Votes of thanks were passed to Messrs. Wm. Paul and Son (Waltham Cross), for collections of Apples and Pears; to Messrs. Paul and Son (Cheshunt), for collections of Apples and Pears; to Messrs. James Veitch and Sons, for collection of Apples; to Messrs. H. Lane and Son, for collection of Apples and Pears; to Messrs. T. Rivers and Son, for collection of Fruit, viz., Apples, Pears and Plums; and to Messrs. Maule and Sons, for Fruit and Preserves of *Pyrus Maulei*.

NOVEMBER 19, 1878.

ORDINARY GENERAL MEETING.

H. J. ELWES, Esq., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Elections.—F. O. Barnes, A. F. Godward, Charles Green, Mrs. D. Maitland, Alfred Sabine, J. A. Swanston, Theophilus Thompson, Rev. H. Tindal, John J. Wilson, and Lieut.-Col. A. Wynch.

The following gentlemen were, upon the nomination of the Council, elected Honorary Corresponding Members of the Society :—The Hon. Marshall P. Wilder, Boston, Mass., U.S.A.; M. Max Leichtlin, Baden-Baden; Professor Charles S. Sargent,

Cambridge, Mass.; Mr. Charles Moore, Botanic Garden, Sydney, New South Wales; Chevalier E. Fenzi, Florence; M. Duchartre, Paris; Baron Ferdinand von Mueller, Melbourne; Dr. R. Schomburgk, Adelaide, South Australia; and Dr. George King, Calcutta.

The Assistant Secretary announced the Awards of the Fruit and Floral Committees, and made some observations on the principal objects of interest exhibited. The fine groups of Chrysanthemums contributed by Messrs. C. Turner and J. Veitch and Sons, were carefully selected assortments, and comprised many remarkably good specimens. Mr. Wills showed the new *Anthurium Gustavii*, having prominently ribbed, cordate leaves, 19 inches long, 15 inches broad; it was procured through the St. Petersburg Botanic Garden. From Messrs. Veitch and Son came another fine hybrid Orchid. *Calanthe Sedeni*, a cross between *C. vestita* and \times *C. Veitchii*, regarding which Mr. Jennings observed that the new hybrid was certainly finer in colour than its parent, *C. Veitchii*, which was raised by Mr. Dominy by crossing *C. vestita* with *Limatodes rosea*, the former being white, with a deep crimson spot, and the latter rosy; the offspring of this union had since been again crossed with the former, and the result was before the Meeting—not a lighter colour such as might have been expected—but a much darker purple than any of its relations, caused, probably, by the greater development of the crimson spot in *C. vestita*, the colour becoming diffused all over the flower. Another fine plant, exhibited by the same firm, was *Cypripedium Lawrenceanum*, introduced from Borneo by Mr. F. W. Burbidge, with a very large, well-marked upper sepal, and handsome variegated foliage in the way of *C. Hookeri*.

SCIENTIFIC COMMITTEE.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair.

This, the first meeting since the recess, was well attended, and the objects brought before the committee were numerous and varied.

Ancient Ploughing.—Mr. Worthington Smith exhibited water-colour sketches of ancient ploughing on Bryn-Glas.

Physianthus albens as a *Moth-trap*.—Mr. MacLachlan alluded to the manner in which this plant retains moths which alight

on the flower and only escape with the loss of their proboscis, as was seen in the specimen exhibited. Mr. Hemsley called attention to the circumstance that this curious faculty was described and illustrated in the *Belgique Horticole* and in the *Flore des Serres*, tom xvii., p. 137.

Bamboo penetrated by Borer.—Mr. MacLachlan, alluding to the attempts to utilise the Bamboo for paper-making in this country by Mr. Routledge, of Sunderland, showed specimens of Bamboo received from Demerara perforated by some wood-boring beetle belonging to the Bostrichidæ. Some conversation ensued as to the use of the Bamboo for paper-making.

Orchis hircina.—The Rev. H. Harpur-Crewe showed a dried flowering stem of this plant, from his garden, measuring between 4 and 5 feet.

Plants Exhibited.—Mr. Elwes showed cut specimens in bloom of a Bomarea which was so hardy as to resist 9° of frost with impunity. Specimens of *Senecio pulcher* flowering for the second time this season were exhibited, as also specimens of *Hedychium heteromallum* and *Gladiolus hirsutus*, which flowers, like the Colchicums, before the leaves are developed.

A Botanical Certificate was awarded to Mr. C. Green, gardener to Sir Geo. Macleay, for *Hoplophytum calyculatum*, and a vote of thanks was also awarded to the same gentleman for a fruiting plant of *Nidularium triste*.

Pods of Lilium.—Mr. S. Jennings showed pods of *L. auratum* and of *L. giganteum*, to show how the valves of the pods were, as it were, tied together for some time after opening, in order that the seeds might mature.

Trees Affected by Lightning.—A communication was read from Mr. T. H. Lewis with reference to the notion that certain trees are more affected than others by lightning, Cedar of Lebanon and Beech being rarely struck, while Oaks, Yews, and Lombardy Poplars are frequently so. Numerous instances were cited by various members of injury done to trees by lightning without disruption, the leaves being completely scorched. Dr. Bennett, of Sydney, mentioned a similar occurrence as having come under his observation at Sydney in the case of *Araucaria imbricata*.

Larch Disease.—Mr. Elwes drew attention to this disease, and to the difficulty of growing the tree on soil and in localities similar to those in which years ago the trees used to thrive.

The effects of frost, canker, aphid, fungus, &c., were alluded to, but no definite conclusion was arrived at as to the real cause of the disease.

Action of Carbolic Acid on Plants.—Mr. MacLachlan alluded to some experiments of Miss E. Ormerod on the action of “Sub-Phenyl” in killing the larvæ of *Psila rosæ*, the Carrot-fly, which feeds on Carrots. Not only were the larvæ destroyed, but the growth of the plant, so far as foliage was concerned, was much promoted.

Nomenclature of Garden Plants.—Dr. Masters read a paper on this subject, pointing out the chief difficulties and sources of confusion, botanical as well as horticultural, and suggesting certain means of remedying the evils, as by the construction of an authoritative standard catalogue of garden plants; by proper supervision and control exercised by the Scientific, Fruit, and Floral Committees respectively, &c.

FLORAL COMMITTEE.

Silver Gilt Flora Medals were awarded to Messrs. J. Veitch and Sons, for groups of dwarf hardy ornamental Shrubs and Chrysanthemums; and to Mr. C. Turner, for group of Chrysanthemums. Small Gold Banksian to Mr. W. Bull, for group of Orchids and new and rare plants. Silver Banksians to Mr. J. Wills, for group of Dracenas; and to Messrs. Hooper and Co., for groups of Cyclamens and Begonias. Bronze Banksian to Mr. J. Smith, gardener to Miss Sullivan, for 12 Chrysanthemums. First Class Certificates were awarded to Messrs. T. Jackson and Son, for Chrysanthemum (Japanese) “*M. Crousse*”; to Messrs. J. Veitch and Sons, for *Calanthe Sedeni*; to Mr. A. Waterer, for *Golden Ilex scotica*; to Mr. J. Jaques, gardener to J. Perrin, Esq., for *Odontoglossum Alexandræ* var. *Perrini*; and to Mr. H. B. Smith, for Cyclamen “*Mont Blanc*.” A Second Class Certificate to Mr. W. Bull, for *Odontoglossum madrense*. A Botanical Commendation to Mr. C. Green, gardener to Sir G. Macleay, for *Hoplophytum calyculatum*. A Cultural Commendation to Sir C. W. Strickland, Bart., for *Coburgia trichroma* (in flower). Votes of thanks were passed to Mr. S. Ford, gardener to W. E. Hubbard, Esq., for Cones of Conifers and Fruits of Shrubs, also for cut sprays of *Cedrus deodara*; to Mr. C. Noble, for Rose “*Queen of Bedders*,” *Thujopsis borealis aureo-variegata*,

and *Gynerium argenteum pumilum*; to Mr. H. Cannell, for group of Pelargoniums; to Mr. J. Atkins, gardener to Colonel Loyd Lindsay, for cut blooms of Chrysanthemums; to Mr. H. B. Smith, for group of Cyclamens; and to Mr. T. Rowley, gardener to W. H. Covington, Esq., for group of Standard Heliotropes.

FRUIT COMMITTEE.

A Silver Knightian Medal was awarded to Mr. S. Ford, gardener to W. E. Hubbard, Esq., for a collection of Apples. Cultural Commendations to Mr. C. Howe, for 6 bunches of Grape "*Black Alicante*"; to Mr. W. Wood, gardener to Lady Augusta Mostyn, for 14 bunches of Grape "*Gros Colman*"; to Mr. J. Atkins, gardener to Colonel Loyd Lindsay, for 6 bunches of Grape "*Muscat of Alexandria*"; and to Harrison Weir, Esq., for Grape "*Champion Muscat*." Votes of thanks were passed to Mr. R. Gilbert, Gardener to the Marquis of Exeter, for Fruit and Vegetables; and to Mr. C. Ross, gardener to C. Eyre, Esq., for 9 smooth Cayenne Pine Apples.

DECEMBER 17, 1878.

ORDINARY GENERAL MEETING.

Sir TREVOR LAWRENCE, Bart., M.P., in the Chair.

The Minutes of the last Meeting were read and confirmed.

Elections.—The Earl of Abingdon, Thos. Baines, H. Ker Colville, John Mares, Mrs. Mares, S. Wharton Simpson, General Sir Charles Staveley, K.C.B.

The Awards of the Fruit and Floral Committees were read by the Assistant Secretary. The chief feature of this Meeting was an extensive display of Evergreen Trees and Shrubs, arranged for decorative effect by Messrs. C. Lee and Son, of Hammersmith, and completely filling the entrance vestibule, a most admirable lesson in the use of such material in the winter months for the enlivenment of open borders or conservatories which are not furnished with heating apparatus. Mr. W. Bull exhibited for the first time *Lalia anceps alba*, a very fine new introduction, well meriting its name, being pure white and of great beauty.

SCIENTIFIC COMMITTEE.

SIR JOSEPH HOOKER, K.C.S.I., C.B., F.R.S., in the Chair.

Nomenclature of Garden Plants.—Some conversation took place as to Dr. Masters' paper on this subject, read at the last meeting ; but it was decided to postpone the discussion until the paper was printed and in the hands of the Fellows.

Monstrous Vegetable Marrow.—Dr. Masters showed, on the part of Mr. Hepper, The Elms, Acton, a dried fruit of a Vegetable Marrow, raised on a long stalk, such as that which supports the male flower. As the specimen was now dry and detached from the vine, it was not possible to give the correct explanation of this singular specimen.

Conophallus? Titanum.—Dr. Masters read a letter from Cav. Fenzi, of Florence, giving further details as to this gigantic Aroid.

Mistleto.—Dr. Masters contributed on the part of Mr. Corderoy, of Blewbury, Didcot, specimens of male and female Mistleto, supposed by the sender to be parasitic the one upon the other ; the female branches are shorter and closer in habit than the male, which are long and whip-like. The specimens were referred to Rev. Geo. Henslow for examination and report. At one of the meetings of the committee in 1869 similar specimens were shown, which were considered to be illustrations of monœcism.*

Dried Bananas.—Mr. G. F. Wilson exhibited specimens of Banana fruits, peeled and dried in the sun. The Hon. and Rev. J. T. Boscawen remarked that *Musa Cavendishi* is very nearly hardy.

Beetle in Ascension.—Mr. MacLachlan reported that the beetle which causes great injury to the vines imported from the Cape of Good Hope into the Island of Ascension, was *Siderodactylus ornatus* (Pascoe), a beetle allied to *Sitones*. The best remedy was to dust the leaves with sulphur or Paris green, or putting a sheet or cloth around the tree and jerking the insects out of it.

Mokurru Resin.—Dr. M. C. Cooke showed specimens of a substance used in India as an astringent, the source of which had hitherto been a subject of dispute. It has, however, been

* (See Masters' *Vegetable Teratology*, p. 509.)

recently ascertained by Mr. Baden Powell to be the produce of *Bombax malabaricum*. The nature of the substance is still doubtful, as there are no traces of insect-puncture, nor is the substance produced as a result of artificial injury to the tree.

Plants Exhibited.—From Mr. Low, of Clapton, came the singular little *Masdevallia trigloch*, a small-flowered species, with flowers of a yellowish brown, with long antenna-like tails. From Sir Geo. Macleay's garden (Mr. Green, gardener,) came *Billbergia nutans*, an elegant Bromeliaceous plant, with a nodding spike beset with pink bracts and greenish flowers, with blue segments edged with white; *Grevillea fasciculata*, a nearly hardy Grevillea, with orange-red flowers, smaller than those of *G. rosmarinifolia*; and *Æchmea Weilbachii*, a Tillandsia-like plant, with a branched spike of coral-red bracts and violet-purple flowers.

Addition to the Lindley Library.—Mr. Jennings reported that he had received from Dr. Masters, "Memoirs of the Botanic Garden at Chelsea."

FLORAL COMMITTEE.

A Gold Flora Medal was awarded to Messrs. Charles Lee and Son, for an extensive collection of hardy evergreen and variegated plants. First-Class Certificates were awarded to Mr. R. Gilbert, gardener to the Marquis of Exeter, for *Primula* (double) "*Earl of Beaconsfield*"; and to Mr. W. Bull, for *Lalia anceps alba*. Botanical Commendations to Mr. C. Green, gardener to Sir G. Macleay, for *Billbergia nutans* and *Grevillea fasciculata*; and to Messrs. Hugh Low & Co., for *Masdevallia trigloch*. Cultural Commendation to Mr. H. Heims, gardener to F. A. Philbrick, Esq., Q.C., for specimen of *Sophronitis grandiflora* (in flower). Votes of Thanks were passed to Mr. R. Gilbert, for plants in flower of Double Primulas; to Mr. H. Cannell, for cut blooms of Pelargoniums; to Mr. Butters, gardener to Mrs. Gerard Leigh, for fruit of *Pandanus reflexus*; and to Mr. H. B. Smith, for a group of Cyclamens in flower.

FRUIT COMMITTEE.

A Silver Knightian Medal was awarded to Mr. W. Gardiner, gardener to E. P. Shirley, Esq., for a collection of Apples and Pears. First-Class Certificates were awarded to Mr. S. Ford, gardener to W. E. Hubbard, Esq., for Apple "*Dr. Hogg*";

and to Mr. R. Gilbert, gardener to the Marquis of Exeter, for Cabbage Broccoli. Highly Commended—Apple “*King William*,” from L. A. Killick, Esq. Cultural Commendations to Mr. D. Wilson, for smooth-leaved Cayenne Pine Apples; to Mr. R. Gilbert, for Cucumber “*Despatch*”; to L. A. Killick, Esq., for collection of Apples. Votes of Thanks were passed to Mr. F. N. Dancer, for 2 varieties of Apples; to Mr. S. Ford, for 6 varieties of Apples; to Mr. J. Douglas, gardener to F. Whitbourn, Esq., for 2 varieties of Grapes; to Messrs. Ross, Coats and Co., for Evaporated Apples; and to Mr. W. Iggulden, gardener to R. B. W. Baker, Esq., for Tomato “*Trophy*.”

LIST OF DONORS OF PLANTS, &c., TO THE SOCIETY'S GARDENS, CHISWICK, 1878.

- Abbott, David, Mr., Riverdale, Sheffield. Vegetable seeds.
- Amies Chemical Manure Company, 79, Mark Lane, E.C. $\frac{1}{2}$ ton manure.
- Barr & Sugden, Messrs., 12, King Street, Covent Garden. Cabbage seed (5 varieties).
- Benary, Ernest, Erfurt, Prussia. Flower seeds (250 varieties), vegetable seeds (44 varieties).
- Bull, William, Mr., King's Road, Chelsea, S.W. Stove and green-house plants (16 varieties).
- Cutbush & Son, William, Messrs., The Nurseries, Highgate, N. Vegetable seeds (5 varieties).
- Carter & Co., James, Messrs., 237 & 238, High Holborn, W.C. Flower seeds (88 varieties), vegetable seeds (30 varieties).
- Clarke, R. T., Col., Welton Place, Daventry. Vegetable seeds (9 varieties), plants (4 varieties), palm seeds.
- Constable, John, Rev., Agricultural College, Cirencester. 23 varieties seeds (Himalayas).
- Carmichael, William, Mr., The Gardens, Nowton Court, Bury St. Edmond's. Vegetable seeds, Sandringham White Celery.
- Chambers, J., Mr., Isleworth. Plants (2 varieties).
- Clapham, A., Esq., Ramsdale Bank, Scarborough. *Mimulus* seed (4 varieties).
- Churchill, Lord A. S., 16, Rutland Gate, S.W., Hardy Ferns (25 varieties).

- Coaling, George, Mr., Seedsman, Bath. Vegetable seeds (2 varieties).
- Denny, John, Dr., Zonal Pelargoniums (11 var.), Begonia seed.
- Downie & Laird, Messrs., Nurserymen, Edinburgh. Penstemons (30 varieties).
- Dean, R., Mr., Ranelagh Road, Ealing. *Primula amoena* (7 varieties) flower seeds.
- Drury, G. D., Mrs., 4, Garway Road, Leicester Square. Conifer seeds.
- Dancer, F. N., Mr., Little Sutton, Turnham Green. Roses (250 plants).
- Dicksons & Co., Messrs., Waterloo Place, Edinburgh. *Violas* (29 varieties), *Phloxes* (27 varieties), *Saxifraga Wallacei*.
- Douglas, James, Mr., The Gardens, Laxford Hall, Ilford, E. Strawberry "Laxford hall seedling" (12 plants).
- Daniels Bros., Messrs., Seedsman, Norwich. Vegetable seeds.
- Dopplet, Herr Von, Erfurt, Prussia. Vegetable seeds (20 varieties), flower seeds (21 varieties).
- Elwes, H. J., Esq., Preston House, Cirencester. Himalayan seeds (80 varieties).
- Fraser & Son, John, Messrs., Lea Bridge, Leyton, E. Plants (10 varieties).
- Fromon, William, Mr., Sutton Court, Turnham Green. *Violas* (12 varieties).
- Frisby, C., Mr., The Gardens, Blankney Hall, Sleaford. "Frisby's Excelsior Beet" (seed).
- Gallop, F., Mr., Nurseryman, Brighton. Flower and vegetable seeds.
- Gumbleton, W. E., Esq., Belgrove, Queenstown, Ireland. Tuberous *Begonias* (12 varieties).
- Harvard Botanic University, America. 27 varieties seed.
- Haughton, William, E. I. U. S. Club, 14, St. James Square, S.W. *Tacsonia mollissima* (cuttings).
- Hope, Miss, Wardie Lodge, near Edinburgh. Herbaceous plants (20 varieties).
- Hurst & Son, Messrs., Seedsman, Leadenhall Street. Vegetable seeds (16 varieties).
- Huss, H. J. L., Mr., 21, Millman's Row, Chelsea, S.W. *Asparagus Argenteuil* (24 plants).
- Hardy, H. J., Mr., Seed Grounds, Bures, Essex. Vegetable seeds.

- Henderson & Son, E. G., Messrs., Pine Apple Nurseries.
Vegetable seeds (2 varieties).
- Hewett, H., Esq., The Cottage, Staplegrove, Taunton. Seedling
potatos.
- Hutchison, Mr., Cilgerron, South Wales. Vegetable seeds.
- Jeffries & Son, Messrs., Nurserymen, Cirencester. Abies
(3 varieties) (6 plants).
- Killick, Lewis, A., Mr., Mount Pleasant, Maidstone. Fruit
trees (6 plants).
- Kittoe, E. H., Rev., Boldmere Vicarage, Birmingham. Seedling
potatos.
- Kew Royal Gardens. Herb and rock plants (97 varieties), seeds,
herb plants (153 varieties).
- King, W. E., Esq., Belgrave Villa, Bournemouth. Seeds of
Tao Bean from China.
- Kinghorn, F. R., Mr., Sheen Nursery, Richmond. Gloxinias (18
varieties), Roses 90 plants in 12 sorts.
- Lawson Seed Company, Edinburgh. Hardy plants (13 varieties),
Begonias (2 varieties).
- Laing & Co., Messrs. John, The Nurseries, Stanstead Park,
London, S.E. 112 Palms in 2 sorts.
- Lemoine, Mons. V., 67, Rue de l'Etang, Nancy. 6 varieties
Pelargoniums (fancy), 11 varieties Pelargoniums (double),
4 varieties Pelargoniums (single), 3 varieties Pelargoniums
(ivy-leaved).
- Lempriere, R. R., Esq., Royal Manor, Jersey. Ferns.
- Mason, Major F., The Firs, Warwick. Pelargoniums zonal.
- McIntyre, A., Victoria Park. Hardy plants (3 varieties).
- Mueller, Baron von, Melbourne, *per* Dr. Masters. 13 var. seeds.
- Macleay, Sir George, Pendell Court, Bletchingley. 14 varieties
seeds from Africa.
- Minier & Co., Messrs., 60, Strand, W.C. Vegetable seeds (45 var.)
- McLean, M., The Gardens, Vintners' Park, Maidstone. Primroses
(4 varieties).
- Matthews, John, Mr., The Potteries, Weston-super-Mare.
Seedling potatos.
- Maher, Mr., Stoke Court, near Windsor. Pea "Queen."
- Pearson, J. R., Mr., The Nurseries, Chilwell, Notts. 12 zonal
Pelargoniums (2 varieties).
- Porter, W., Mr., Isleworth. Pelargoniums zonal (11 varieties).

- Porter, W., Mr., Oldmeldrum, N.B. Turnip seeds (2 varieties).
- Parker, Robert, Mr., The Nurseries, Tooting. 16 aquatic plants (12 varieties).
- Parker, Lady, Stawell House, Richmond. *Crinum* species (6 bulbs).
- Rumsey, William, Mr., Joyning's Nursery, Waltham Cross. Vegetable seeds (3 varieties).
- Rutherford, George, Esq., Printonan, Coldstream. Seedling potatoes.
- Ransom, George, Esq., 32, Denbigh Street, Belgrave Road. Seeds of creepers (3 varieties).
- Ross, George, Mr., Laurence Kirk, N.B. 12 plants *Violas*.
- Roger, McClland & Co., Messrs., Nurserymen, Newry. 1 *Begonia primulina*.
- Sandbach, H. R., Esq., Hafodunos, Abergele, N. Wales. Hardy plants (3 varieties).
- Saunders, W. Wilson, Esq., Raystead, Worthing. *Sedum sempervivum* (20 varieties), *Pelargoniums* Cape (12 varieties), *Fuchsias* (13 species).
- Strickland, Sir C. W., Hildenley, Malton. *Doryanthes Palmeri* (9 plants.)
- Sime, A., Mr., The Gardens, Lytham Hall, Near Preston. *Anemone* "Honorine Jobert" (30 plants).
- Sisley, Mons. Jean, Montplaisir, Lyons, France. *Pelargoniums* (2 varieties).
- Surnan, H., Mr., florist, Witney. *Pelargoniums* double (3 var.)
- Smith, G., Mr., Hedge Lane, Edmonton. Zonal *Pelargoniums*.
- Thompson, David, Mr., The Gardens, Drumlanrig, N.B. *Celosia* seed 2 packets.
- Turner, Charles, Mr., Royal Nurseries, Slough. Vegetable seeds (2 varieties).
- Veitch & Sons, Messrs. James, The Nurseries, Chelsea. Plants (6 varieties), vegetable seeds (22 varieties).
- Vilmorin et Cie, M.M., 4, Quai de la Megassene, Paris. Flower seeds (64 varieties), vegetable seeds (63 varieties).
- Watkins & Simpson, Messrs., 1, Savoy Hill, Strand. Vegetable seeds (11 varieties).
- Wrench & Sons, Messrs. Jacob, London Bridge, E.C. Vegetable seeds (11 varieties).
- Williams, B. S., Mr., Victoria Nurseries, Upper Holloway. Fruit trees (3 varieties), Plants (3 varieties).

Watts, John, J., Esq., Devizes. Seeds of a creeper.

Weir, Harrison, Esq., Weirleigh, Brenchley, Kent. Gloxinias
(19 varieties).

AWARDS OF FRUIT COMMITTEE AT THE CHISWICK TRIALS, 1878.

[F.C., First-class Certificate.]

- Endive, Fine curled Picpus, Vilmorin & Co., October 11. F.C.
- „ Round-leaved Batavian, Carter & Co., October 11. F.C.
- „ „ „ Minier & Co., October 11. F.C.
- „ „ „ Veitch & Sons, October 11. F.C.
- „ „ „ Vilmorin & Co., October 11. F.C.
- „ White curled, Carter & Co., October 11. F.C.
- „ „ Minier & Co., October 11. F.C.
- „ „ Veitch & Sons, October 11. F.C.
- „ „ Vilmorin & Co., October 11. F.C.
- Pea, Telephone, Carter & Co., June 27. F.C.

NEW FRUITS, &c., CERTIFICATED BY THE FRUIT COMMITTEE, 1878.

[F.C., First-class Certificate; H.C., Highly Commended; C., Commended.]

- Apple, Baumann's red Winter Pearmain, R.H.S., Oct. 15. F.C.
- „ Dr. Hogg, Ford, December 17. F.C.
- „ King William, Killick, December 17. H.C.
- Broccoli (cabbage), Gilbert, December 17. F.C.
- Melon, Dell's Hybrid, Dell, July 2. F.C.
- „ Netted Victory, Gilbert, July 2. F.C.
- Orange (long), Rivers, January 15. F.C.
- Peach, Hale's Early, Rivers, June 18. F.C.
- Pear, Dr. Hogg, Rivers, September 17. F.C.
- Plum, River's Sultan, Dancer, August 20. F.C.
- Universal travelling pot (Tebb's), Blake & Mackenzie, June 4. C.

NEW PLANTS, &c., CERTIFICATED BY THE FLORAL COMMITTEE, 1878.

[F.C., First-class Certificate; S.C., Second-Class Certificate; B.C., Botanical Commendation; H.C., Highly Commended; C., Commended.]

- Adiantum cyclosorum*, Veitch, June 4. F.C.
 „ *Lawsonianum*, Veitch, Williams, May 7. F.C.
 „ *neoguineense*, Williams, May 21. F.C.
 „ *tetraphyllum gracile*, Bull, April 16. F.C.
Aerides vandarum, Veitch, February 15. B.C.
Alocasia Johnstonii, Bull, April 16. B.C.
Alsophila plumosa, Williams, May 21. F.C.
Amaryllis Crimson Banner, Little, April 2. F.C.
 „ *E. Pilgrim*, Williams, April 16. F.C.
 „ *Mrs. Rawson*, Williams, March 5. F.C.
Anemidictyon phyllitides tessellata, Williams, May 7. F.C.
Androsace sarmentosa, Atkins, May 7. B.C.
Anthurium Scherzerianum album, Veitch, October 15. F.C.
Aquilegia alpina superba, Dean, May 7. F.C.
Aspidium crinitum, Bull, October 15. F.C.
Auricula (alpine) Silvia, Douglas, May 7. F.C.
Azalea Kaiser Wilhelm, Veitch, May 7. S.C.
 „ *Madame E. Eeckhaute*, Veitch, May 7. F.C.
 „ *Wm. Carmichael*, Williams, March 5. F.C.
Begonia Calypso, Laing, June 18. F.C.
 „ *Chiswick Blush*, R.H.S., August 6. F.C.
 „ *Louis Thibaut*, Hooper, September 17. F.C.
 „ *Mrs. Dr. Todd*, Laing, August 6. F.C.
 „ *Nellie May*, R.H.S., September 17. F.C.
Billbergia nutans, Green, December 17. B.C.
Blechnum interruptum, Clayton, August 20. B.C.
 „ *President Burelle*, Laing, May 21. F.C.
Bollea Patinii, Veitch, March 19. F.C.
Bomarea Caldasi, Ellacombe, May 7. F.C.
 „ *Carderii*, Bull, Green, October 15. F.C.
Calanthe Sedeni, Veitch, November 19. F.C.
Caltha palustris fl. pl. minor, Parker, April 16. F.C.
Camassia Brownii (?), Elwes, May 7. F.C.
Campanulas (for strain), Dean, June 18. C.
Cattleya Mitchellii, Mitchell, August 20. F.C.

- Cattleya Veitchiana*, Veitch, August 20. F.C.
Chrysanthemum (Japanese), M. Crousse-Jackson, Nov. 19. F.C.
Cinerarias (for strain), James, February 15. H.C.
Clematis (double), Duke of Connaught, Jackman, May 28. F.C.
 „ *Viticella*, Earl Beaconsfield, Cripps, June 18. F.C.
Coleus George Bunyard, Veitch, May 7. F.C.
 „ *Kentish Fire*, Williams, May 7. F.C.
Crinum bracteatum, Veitch, April 16. F.C.
Croton Williamsii, Williams, August 20. F.C.
Cycas media, Williams, May 21. F.C.
Cyclamen persicum, Mont Blanc, H. B. Smith, Nov. 19. F.C.
 „ „ *roseum grandiflorum*, Edmonds, Feb. 15. F.C.
 „ „ *Rosy Morn*, H. B. Smith, Feb. 15. F.C.
 „ „ *White Beauty*, James, February 15. F.C.
Cypripedium spectabile, Rawson, June 18. H.C.
Dactylis elegantissima aurea, Cannell, June 18. F.C.
Dahlia Aurora, Keynes, September 17. F.C.
 „ *Clara*, Rawlings, September 17. F.C.
 „ *Gaiety*, Keynes, September 17. S.C.
 „ *Helen Macgregor*, Turner, August 20. F.C.
 „ *Joseph Ashby*, Turner, September 17. F.C.
 „ *Prince Bismarck*, Turner, August 20. F.C.
 „ *lutea* (single), as a decorative flower, Cannell, Sep. 17. F.C.
 „ *Paragon* (single), as a decorative flower, Cannell, Sep. 17. F.C.
Davallia fijiensis, Bull, April 16. F.C.
Dendrobium D'Albertsii, Williams, August 6. B.C.
 „ *linguæforme*, R.H.S., March 19. B.C.
 „ *superbiens*, Williams, January 15. F.C.
Dietes Huttoni, Green, April 16. F.C.
Dioscorea retusa, Veitch, May 7. B.C.
Dracæna Bijou, Bull, May 28. F.C.
 „ *vivicans*, Bull, June 18. F.C.
Epidendrum Wallisii, Veitch, March 5. B.C.
Erica obbata expolita, Rollisson, June 18. F.C.
Eulalia japonica zebrina, Laing, September 17. F.C.
Freesia refracta var. *alba*, New Plant and Bulb Company, July 2. F.C.
Gladiolus Gorgonius, Kelway, August 6. F.C.
 „ *Herois*, Kelway, August 6. F.C.

- Gladiolus Telamon*, Kelway, August 6. F.C.
Gloxinia, Beauty of Anerly, Wills, May 7. F.C.
 „ *Berkshirei*, Fisher, May 28. F.C.
 „ *Boule de Feu*, Duval, May 21. F.C.
 „ *Mont Blanc*, Duval, May 21. F.C.
Grevillea robusta var. *flicifolia*, Rollison, April 16. F.C.
Grevillea fasciculata, Green, December 17. B.C.
Gunnera manicata, Green, June 4. F.C.
Hæmanthus Kalbreyerii, Veitch, May 21. F.C.
 „ *rupestris*, Bull, February 15. F.C.
Hoplophytum calyculatum, Green, November 19. B.C.
Hyacinth Grand Master, Cutbush, March 19. F.C.
 „ *King of Blacks*, Veitch, March 19. F.C.
Ilex Scotica (golden), Waterer, November 19. F.C.
Iochroma elegans, Green, May 7. B.C.
Iris Leichtlinii, Elwes, May 7. F.C.
Kentia rupicola, Bull, May 28. F.C.
Lælia anceps alba, Bull, December 17. F.C.
Lastrea aristata variegata, Bull, Veitch, October 15. F.C.
Lathyrus Drummondii, Dean, Green, June 4. F.C.
Lilium Hansonii, Wilson, June 18. F.C.
 „ *tenuifolium*, Wilson, May 21. F.C.
Liparis elegantissima, Veitch, May 21. B.C.
Macrozamia cylindrica, Bull, September 17. F.C.
Magnolia Halleana, Veitch, March 19. F.C.
Mamillaria sphacelata, Boller, October 15. F.C.
Marica pacifica, Bull, May 7. F.C.
Masdevallia radiosa, Williams, April 2. B.C.
 „ *triglochin*, Low, December 17. B.C.
 „ *velifera*, Bull, October 15. B.C.
Megasea purpurascens, Parker, April 16. F.C.
Microlepia hirta cristata, Williams, January 15. F.C.
Narcissus incomparabilis aureo tinctus Leedsii, Barr, March 19. F.C.
Nelumbium luteum (as a fine-foliaged plant), Green, Sep. 17. F.C.
Odontoglossum Alexandræ var. *Perrinii*, Jaques, Nov. 19. F.C.
 „ *madrense*, Bull, November 19. S.C.
 „ *pardinum*, Mill, March 19. F.C.
Pelargoniums (Cape), 3 varieties, Pearson, July 2. H.C.
 „ (*echinatum*), Ariel, Pearson, July 10. F.C.

- Pelargoniums* (*echinatum*) Beauty, Pearson, July 10. F.C.
 „ „ Pixie, Pearson, July 10. F.C.
 „ (fancy), Insulaire, Turner, June 18. F.C.
 „ „ Janette, Turner, June 18. F.C.
 „ „ Placida, Turner, June 18. F.C.
 „ (ivy-leaved double), A. F. Barron, Lemoine, May 21. F.C.
 „ (ivy-leaved) Elfrida, Lemoine, July 2. F.C.
 „ „ Lucie Lemoine, Lemoine, July 2. F.C.
 „ (show), Amethyst, Turner, June 18. F.C.
 „ „ Bertie, Turner, June 18. F.C.
 „ „ Criterion, Foster, June 18. F.C.
 „ „ Dauntless, Foster, June 18. F.C.
 „ „ Fortitude, Turner, May 28. F.C.
 „ „ Invincible, Foster, June 18. F.C.
 „ „ Marmion, Foster, June 18. F.C.
 „ „ Symmetry, Foster, June 18. F.C.
 „ (zonal) Fanny Catlin, Catlin, June 18. F.C.
 „ „ Madonna, Denny, June 18. F.C.
 „ „ Manfred, Denny, June 18. F.C.
 „ „ Sunbeam, Denny, June 18. F.C.
 „ „ Titania, Denny, June 18. F.C.
Pernettya mucronata lilacina, Davis, October 15. F.C.
Petunias (for strain), G. Smith, July 2. C.
 „ (striped) for strain, Marcham, June 18. C.
Phalænopsis violacea, Veitch, October 15. B.C.
Platycerium Hillii, Veitch, June 4. F.C.
Potentilla Prince Arthur, Perkins, June 18. F.C.
Primrose Ealing Crimson, Dean, March 5. F.C.
 „ Octoroon, Dean, March 5. F.C.
 „ Prince Charming, Dean, April 2. F.C.
 „ Scott Wilson, Wilson, March 5. F.C.
Primula acaulis sulphurea major, Veitch, May 7. F.C.
 „ *sinensis fimbriata coccinea*, Williams, Feb. 15. F.C.
 „ double, "Earl of Beaconsfield," Gilbert, Dec. 17. F.C.
Pterostylis Baptistii, Williams, January 15. F.C.
Ptychosperma rupicola, Williams, May 21. F.C.
Rhipidopteris peltata gracillima, Veitch, May 7. F.C.
Rhododendron, The Tocsin, Noble, June 18. F.C.
Rose (H. P.) Countess of Rosebery, W. Paul & Son, June 18. F.C.

- Rose (H.P.) Dr. Sewell, Turner, July 2. F.C.
 „ „ Duchess of Bedford, W. Paul & Son. July 2. F.C.
 „ „ Harrison Weir, Turner, July 23. F.C.
 „ „ Penelope Mayo, Turner, July 2. F.C.
Saccolabium calceolare, Rollisson, February 15. B.C.
Sadleria cyathioides, Williams, May 21. F.C.
Saxifraga calyciflora, Atkins, May 7. F.C.
 Sweet Williams (for strain), Dean, July 2. C.
Torenia Bailloni, Veitch, August 6. B.C.
Wallichia zebrina, Williams, April 16. F.C.
Xeronema Moorei, Veitch, June 4. F.C.
Zamia corrugata, Bull, January 15. F.C.
 „ *lucida*. Bull, January 15. F.C.

NEW FLOWERS CERTIFICATED BY THE FLORAL
 COMMITTEE AT THE CHISWICK TRIALS, 1878.

[F.C., First-class Certificate.]

- Abutilon* Louis Marignac, Bull, Lemoine, August 16. F.C.
 „ *Reine d'or*, Veitch, August 16. F.C.
Pelargonium (Double-flowered), Delobel, Lemoine, Aug. 16. F.C.
 „ „ „ Ernest Lauth, Lemoine, Aug.
 16. F.C.
 „ „ „ Jean Dolfus, Lemoine, August
 16. F.C.
 „ „ „ *Nymphe*, Lemoine, Aug. 16. F.C.
 „ (Ivy-leaved), Madlle. Adrienne Barat, Lemoine,
 August 16. F.C.
 „ „ „ Sarah Bernhardt, Lemoine, August
 16. F.C.
 „ „ „ Viscountess Cranbrook, Lemoine,
 August 16. F.C.
 „ (Zonal), Dr. John Denny, Sisley, August 16.
 „ „ Jeanne d'Arc, Lemoine, August 16.
 F.C.
 „ „ *Cethe*, Denny, August 16. F.C.
 „ „ Sophie Birkin, Pearson, August 16.
 F.C.
Verbena, Mrs. Æmelie Hulter, Fraser, August 16. F.C.

JANUARY 14TH, 1879.

ORDINARY GENERAL MEETING.

H. J. ELWES, Esq., in the Chair.

Notwithstanding the very unfavourable weather, there was a most interesting collection of plants exhibited. Two important groups of more than ordinary interest were displayed. That which had completely filled the entrance vestibule since the middle of December, contributed by Messrs. Charles Lee and Son, of Hammersmith, had apparently not suffered in the least from the severe frost and sudden thaw, showed how much may be done in the way of conservatory decoration with handsome evergreen foliage plants only, which require no artificial heat at all. Messrs. Lee's collection consisted of varieties of *Cupressus*, *Juniperus*, *Abies*, *Thuja*, *Biota*, *Taxus*, *Retinospora*, *Euonymus*, *Ligustrum*, *Osmanthus*, &c., &c., amongst the more striking of which may be named *Taxodium alba spica*, with graceful branches, each of which is tipped with white; *Taxus fastigiata aurea* (Standish), with bright golden foliage; *Retinospora obtusa aurea* and *R. pisifera aurea*, both with graceful habit and golden foliage, and quite hardy; some plants of *Osmanthus ilicifolia*, grown as standards grafted on the common privet, and of *Euonymus*, and variegated *Ligustrums*, as standards, were much noticed. The object of Messrs. Veitch and Son's group, on the other hand, was to show how much beauty and fragrance might be afforded by forcing some of our well known hardy flowering shrubs, the White Lilac for example. *Staphylea colchica*, a well known hardy shrub, was now made to appear in a new, interesting, and highly satisfactory character as a forced plant covered with bloom. There were also in this collection some fine specimens of *Daphne indica* in flower, *Primula sinensis* and Lily of the Valley. Messrs. Osborn and Sons exhibited a group of *Aucubas*, in very fine berry. Mr. Cannell, of Swanley, showed some cut blooms of *Pelargoniums*, almost superior in colour, size and form to anything that had been seen during the summer; Mr. Cannell's success in flowering *Pelargoniums* in the winter is remarkable. Mr. Williams showed a few Orchids, one of which, *Cymbidium affine*, is quite new; it has the habit of *C. Parishii*, which indeed it was taken to be before

it flowered. The flower spike is somewhat similar to *C. Mastersii*, the inflorescence is white, the lip being slightly dotted with purple; it is fragrant. A plant of *Odontoglossum Rossii grandiflorum* of an unusually fine type and a well grown mass of *Sophronites grandiflora*. A very fine collection of *Primula sinense* was staged by Messrs. Sutton and Sons, of Reading, for one of which *P. "Ruby King,"* a First-Class Certificate was awarded, a like distinction being won by the beautiful *Cyclamen "Reading Gem,"* also exhibited by the same firm. From the Society's Gardens at Chiswick came an interesting lot of *Primula sinense*, including the original species in both colours.

Medals Awarded.—Silver-gilt Flora to Messrs. James Veitch and Sons, for group of flowering plants. Silver Banksians to Messrs. Sutton and Sons, for group of Primulas; and to Mr. W. Brown, for ditto.

SCIENTIFIC COMMITTEE.

ARTHUR GROTE, Esq., F.L.S., in the Chair.

Double Leaf of Camellia.—Dr. Masters showed a curious example in which the leaf was split into two. There were two distinct mid ribs; it was not a fusion of two leaves.

Insect Injurious to Iris, &c.—Mr. S. Webb showed a moth, *Nonagria Sparganii*, the larva of which on the Continent is known to feed on Typha and Sparganium, but which in this country is found to prey on the stems of Irises, especially *I. pumila*. The insect is of recent introduction to this country.

Beetle Injurious to Cocoa Palms.—Mr. Thiselton Dyer showed a large beetle, sent by Dr. Kirk from Zanzibar, where it has proved exceedingly injurious to the Cocoa-nut Palms. Its ravages had not assumed any importance till after the hurricane of a few years since, after which it multiplied rapidly at the expense of the fallen and rotting trunks, and it now attacked the living plants. Some had been saved by following its track in the stem and cutting it out. The specimen was referred to Mr. MacLachlan for identification.

Narcissus Tazetta var. aureus.—Mr. W. W. Saunders sent flowers of an autumn flowering, pale yellow flowered, sweet scented *Narcissus*, which has the valuable property of flowering in the late autumn and of withstanding at least 11° of frost with-

out injury. It had been identified by Mr. Baker as *N. Tazetta* var. *aureus*, and is well figured in the late Mr. Moggridge's *Flora of Mentone*. The Rev. H. H. Crewe observed that the Tazetta group was imperfectly understood. Precocity of inflorescence might arise from change of habit without any distinction of species. He had a single bulb of a white flowering Tazetta with yellow cup, received from Malta, which bloomed two successive years in October, and a *Galanthus*, gathered by Lord Walsingham either in Greece or Albania, which had for three seasons running bloomed in October. Mr. Baker pronounced the *Narcissus*, as far as he was able to decide, to be *patulus*, Lois, (*Hermione patula*, Haw,) but said this was a late vernal species. He also said that he could see nothing in the *Galanthus* which differed from the ordinary *G. nivale*.

Vegetable Remains from Ancient River Gravels.—Mr. Worthington G. Smith exhibited under the microscope a series of preparations of vegetable and other remains he had found *in situ* associated with Palæolithic implements in the drift gravels of the Lea and Axe. The Lea remains were 12 and the Axe remains 30 feet beneath the surface. Under the microscope the minute structure of the plant-remains was clearly seen, the fragments of cellular tissue, epidermis, &c., in some specimens being very perfect. One slide with a piece of human hair, stained and corroded by the gravelly matrix from which it was taken, attracted considerable attention. Mr. Smith's collection of microscopic objects of Palæolithic age included fragments of leaves and roots of plants, a seed or two, hairs belonging to various mammalia, a portion of a feather, and several objects of unknown nature. The gravel from which the remains were derived was dug by Mr. Smith himself.

Plants Exhibited.—From Mr. B. S. Williams came a specimen of a plant supposed to be the *Pandanophyllum humile* of Haskarl, a Pandanus-like plant of tufted habit, with triangular stock and sheathing, strap-shaped leaves, tapering into a long point. The flowers are inconspicuous, and borne in close spikes raised on a terete peduncle. The plant is of much botanical interest, being allied to Pandanaceæ and Cyperaceæ. It has lately been referred to the genus *Hypolytrum*, and is a native of Java. It has been cultivated at Kew for several years. A Botanical Certificate was awarded on the ground of botanical interest.

From Mr. G. F. Wilson came a plant of *Oncidium Widgreni*, of Lindley (*Folia Orchidacea*, vol. i., p. 17, n. 50), a Brazilian species, with small pseudobulb, solitary oblong lanceolate leaf, 3 to 4 inches long, and a raceme of about a dozen yellowish flowers, barred and spotted with brown, and the stalk of the lip marked with two rows of small tooth-like processes. A Botanical Certificate was awarded on the ground of rarity. A Bulbophyllum, shown by Mr. Douglas, gardener to F. Whitbourn, Esq., Loxford Hall, was referred to the authorities at Kew for identification, a certificate being withheld until the name of the species is authoritatively determined. It was supposed to be *B. auricomum*.

FLORAL COMMITTEE.

Medals Awarded.—Silver Banksians to Messrs. Sutton and Sons and Mr. W. Brown, for groups of Primulas; Silver-gilt Flora to Messrs. J. Veitch and Sons, for a miscellaneous collection of early Spring-flowering Plants. First-class Certificates were awarded to *Staphylea colchica* (as a forcing plant), from Messrs. J. Veitch and Sons; to Primula "*Ruby King*," and Cyclamen "*Reading Gem*," from Messrs. Sutton and Sons; and to Amaryllis "*Dr. Masters*," from Mr. B. S. Williams. Cultural Commendation to cut blooms of Pelargonium, from Mr. H. Cannell. Votes of Thanks were passed to G. F. Wilson, Esq., F.R.S., for *Oncidium Widgreni* (in flower); to Mr. E. Spary, for cut flowers of Seedling Poinsettias; to Mr. H. Cannell, for group of Primulas; to Mr. G. Thomson, for *Crassula lactea* (in flower); and to Messrs. Osborn and Sons, for a group of Plants.

FRUIT COMMITTEE.

Cultural Commendation to Mr. W. Pratt, The Gardens, Hawkstone, for Mushrooms. Letters of Thanks to Mr. J. Muir, The Gardens, Margam Park, for Apples. To Messrs. J. Veitch and Sons, for two varieties of Sea Kale.

FEBRUARY 11, 1879.

ANNUAL MEETING.

The Rt. Hon. LORD ABERDARE, President, in the Chair.

The members of the Council present were Lord Alfred S. Churchill, Sir Trevor Lawrence, Bart., M.P., Major R. Trevor Clarke, Major Mason, Mr. William Haughton, Dr. Denny, Henry Webb, Esq. (Treasurer), and Dr. Hogg (Secretary). There was an unusually large attendance of Fellows, the Council-room being nearly filled.

Mr. S. Jennings, the Assistant Secretary, read the minutes of the last general meeting, which, upon the proposition of the Chairman, were confirmed. The names of newly elected Fellows having been read, the President then briefly alluded to the objects of the meeting, and stated that the first business was the appointment of scrutineers—Mr. John Lee and Mr. West.

Mr. Shirley Hibberd stated that, as the proposer of Mr. W. B. Kellock as a member of the Council, he assumed he had the right of proposing a scrutineer either in the place of one of the two gentlemen named, or as an addition to them.

Mr. Haughton submitted that they had no power to make an addition, and the appointment resting with the Chairman the business proceeded.

The President then proposed that the report of the Council be taken as read, which was agreed to; but on commencing to move its adoption he was reminded that it would be opportune to refer to the nomination of the gentlemen to the Council, two of whom he found were opposed. The Council's nomination to fill the vacancies caused by the retirement of Messrs. W. Haughton, C. J. Freake, and Philip W. S. Miles, were A. Grote, F.L.S., Col. W. Makins, M.P., and R. A. Aspinall. In the place of the two latter gentlemen the names of Lord Skelmersdale and Mr. Kellock had been submitted. In reference to the former the Chairman observed that Lord Skelmersdale was not a member of the Society at the time of their nomination; but immediately it was known that his lordship intended joining the Society and was willing to take part in its management, Mr. Aspinall in the most handsome manner withdrew in his favour (cheers). In respect to Mr. Kellock that gentleman had had an experience of five years on the Council, and was a most valuable member of the Society—one who had always discharged

his duties well ; and having been absent from the Council for twelve months he was undoubtedly eligible for re-election ; but while admitting Mr. Kellock's fitness the Council could not overlook the importance of having fresh blood, hence they had nominated a gentleman who it was hoped might bring them new ideas—a gentleman of broad views, great intelligence, and one who he was sure took real interest in the welfare of the Society. While, therefore, they had nominated Col. Makins it was not because they had any objection to Mr. Kellock ; and if that gentleman was elected they would be quite ready to accept him, and proud to take him by the hand : therefore the question was entirely in the hands of the meeting. On the votes being collected the Chairman announced that the following gentlemen had been elected by a large majority—Mr. Grote, Col. Makins, and Lord Skelmersdale, and that the Officers of the Society had been re-elected *nem. con.*

The President, on proceeding to remark on the report, said his observations would be brief. He referred to the general confidence that existed, to the great excellence of the meetings, and to the magnificence of the shows of last year, and would have been glad if the meeting could have heard the warm marks of approval of the Princess of Wales, the Crown Princess of Germany, and other members of the Royal Family respecting the fine displays that they visited. The next question was the present position of the Society. In consequence of having failed to raise the sum of £10,000 as required by the time stipulated (25th December, 1878) their legal term of occupancy ceased. In reference to the future the Commissioners had not yet arrived at any decision as to the gardens, but a letter from General Scott stated that a meeting would be shortly held on the subject. He (the Chairman) believed the deliberations of the Commissioners need not disturb the Fellows. The Commissioners he was sure were willing to do all in their power for the Society, and it might be taken for granted that no arrangements will be arrived at to injure it as a scientific body. As to the space occupied by the gardens that was another matter, and it was possible that the Commissioners would feel themselves justified in employing at least a portion of that space in a more profitable manner ; but at present nothing on that point was settled.

Lord Alfred Churchill seconded the adoption of the report, which was carried unanimously.

Mr. Shirley Hibberd said: We appear to be in a very distressing way with regard to the debenture debt, and our position appears to be this—that we have no legal right to the ground on which we tread; we may enjoy it for a time, but the Commissioners may turn us out at any moment, and he thought it would be better to be turned out at once than to endure the present uncertainty. Under any circumstances if we occupy these grounds we ought to pay a rent. Hitherto these gardens have been a security for the debenture debt, but now the security ceases, and responsibility is being incurred by somebody, possibly by the Council. On such an occasion as this he thought we ought to know something more clear on this point than is stated in the report.

The President assured the meeting that the Council did not incur any responsibility in regard to that debt, the conditions of which were satisfactorily explained.

Dr. Masters expressed his regret that the report was not circulated several days prior to the meeting; he had only had time to glance hurriedly through it, but so far as he could see it was in many respects satisfactory; yet he was disappointed at not finding any allusion to the financial result of the Preston Show, and he requested information on that point.

The President briefly replied that the Society was not responsible for the finances referred to, and at the same time regretted that the weather and other circumstances militated so seriously against the success financially of that gathering.

A Fellow then asked on whom the responsibility of the loss fell if not upon the Society; to which his lordship replied, that although that was no doubt an interesting matter, he was not quite in a position to answer the question.

A question was then asked respecting the closing of the north-west gate of the gardens, and it was explained that as a matter of economy the gate was kept closed in the winter when access was not wanted by it, and it would no doubt be opened again in the summer as usual.

After Col. Makins had thanked the meeting for electing him on the Council, Mr. Harry Veitch proposed a vote of thanks to the Chairman and the Council for their services, briefly alluding to the great increase of the Fellows of the Society and the distribution of plants, and the meeting terminated.

REPORT OF THE COUNCIL TO THE ANNUAL GENERAL MEETING OF 11TH FEBRUARY, 1879.

In presenting to the Fellows their Report of the operations of the Society during the past year, the Council are gratified to record a continuance of the improved interest in its proceedings, as evinced by the success of the various Shows and Meetings which, during the year now closed, have been remarkable for the spirit which has animated the Committees, and the unvarying energy displayed by all classes of Exhibitors.

At no period of the Society's history have the meetings been so well attended, or such important and interesting groups of plants and collections of fruit displayed; so that these ordinary meetings have in variety and beauty fallen little short of the greater Flower Shows.

The meetings of the Scientific, Fruit and Floral Committees have been numerous attended; and the members have been most diligent in the discharge of their honorary duties. The usual high standard of excellence both as to fruit and plants has been maintained; a complete list of the Certificates awarded will be published in the next number of the Society's Journal. The Council have much satisfaction in recognising the valuable work that has thus been accomplished.

In order to increase the general interest of the meetings of the Committees during the current year, and to give some direction to their work, it has been determined to award Medals for special exhibitions of plants, &c., in the groups designated for each successive meeting.

Four parts of Vol. V. of the Society's Journal have been published during the year, the first of which, issued in January, was under the editorship of the late Mr. Andrew Murray.

The contributed papers comprise Dr. M. C. Cooke's exhaustive treatises "On the Fungoid Diseases of the Vine"; a lecture delivered by the Assistant Secretary on the "Cyclamen"; a paper by Dr. M. T. Masters, F.R.S., "On the Nomenclature of Garden Plants"; notes by Col. R. Trevor Clarke "On the Culture of the Fig as a Standard in the Open Air"; "On Fern Sports," by T. Moore, F.L.S.; "On the Native Country of the Potato," by W. B. Hemsley, A.L.S.; and "On a Disease in the Ash," by W. W. Saunders, F.R.S.

The Reports of Chiswick trials include *Violas*, *Clarkia*, *Iberis*, *Viscaria*, *Godetia*, *Tomatos*, *Asters*, *Turnips*, *Filberts* and *Savoys*.

Records of the proceedings of all the meetings of the Society as well as of the Scientific, Fruit and Floral Committees from the beginning of the year, up to and including the meetings of the 23rd July, will also be found in the numbers of the Journal published. Matters of considerable interest resulting from the deliberations of the Scientific Committee are also fully reported.

The Fruit Catalogue which was published in the Society's Journal several years ago is now under revision and will be corrected up to date. It is intended to re-print this most valuable work in the form of an appendix to the Journal.

The annual exhibition of the Society, which was honored with the presence of Her Royal Highness the Princess of Wales, of the Crown Prince and Princess of Germany, and other members of the Royal Family, is acknowledged to have been one of the most successful that has been held in this country since the great International Exhibition of 1866, and their Royal Highnesses were pleased to express their admiration of the magnificent display. The Council have every reason to anticipate that the arrangements they have made for the great Show, to be held in May next, will ensure an equally successful Exhibition. The Rose Show, with which was associated the Annual Exhibition of the *Pelargonium* Society, was also a most extensive and beautiful display.

With a view to carry out one of the principal objects of the Society in popularising Horticulture, the Council resolved to attempt an Exhibition for the benefit of the poorer classes of the Metropolis. Whit-Monday was selected for the experiment, and the low charge of twopence was fixed for admission. Thanks to several Fellows of the Society, and a few of the City Companies, a liberal schedule was provided by private subscription; and several of the leading Exhibitors at the Society's Ordinary Meetings generously contributed splendid groups of plants. The results were highly satisfactory; nearly 16,000 persons availed themselves of the privilege, and perfect order prevailed. H. R. H. the Princess Louise, Marchioness of Lorne, had graciously consented to distribute the Prizes upon this occasion, but in consequence of a recent domestic bereavement, was unable to be present; and that duty was kindly performed by the Lady Mayoress, who was accompanied by the Lord Mayor and the

Sheriffs of London. It is intended to organize a similar Show next Whit-Monday.

After an interval of five years, arrangements were made for holding a Provincial Show at Preston, under the auspices of the Society. The success of this magnificent Exhibition, which was held in July last, was, from a horticultural point of view, complete.

In the present depressed state of trade, your Council have not felt themselves justified in accepting any of the invitations which they have hitherto received to organize a Provincial Show for the coming season.

The condition of the Garden at Chiswick is satisfactory. The Rockery formed at the commencement of 1877, has proved a most interesting attraction; the season having been favourable, the plants have succeeded remarkably well. Considerable additions have been made to the collection of hardy herbaceous and alpine plants, which will be gradually propagated for distribution to Fellows.

The severe frost which has prevailed during the present winter, has done to the out-door plants at Chiswick serious damage, the full extent of which cannot be ascertained as yet. The lowest temperature registered at Chiswick has been 12° , *i.e.* 20° of frost.

The crop of Grapes in the great vinery has been good; the fruit has been sold to Fellows at reduced rates, a privilege which has been greatly appreciated. A wonderful crop of fruit has been produced on the cordon Peach trees on the wall; an experiment which has proved instructive as a means of comparing the different varieties.

Collections of the most approved varieties of Figs have been planted out as standards in the old Orchard House, which has been entirely devoted to the trial of their adaptability for this mode of culture.

The Vines newly planted under the glass wall have done well.

Owing to the late spring frosts the out-door fruit crop proved almost a failure.

All necessary repairs to the hot-houses have been carried on as usual, the alterations effected last year in the heating apparatus have proved entirely satisfactory.

The following trials have been carried out by the Fruit and Vegetable Committees:—*Cabbages*, in continuation of the 1877

trials. *Peas*, 110 varieties. *Lettuces*, 115 varieties. *Endives*, 30 varieties. *Beet*, 60 varieties. *Strawberries* in pots, 150 varieties. Of these, the trial of *Peas* owing to the peculiar season was not satisfactory, they will therefore be tried again. A second trial of *Lettuces*, *Radishes* and *Leeks* will also be made.

Full Reports by the Superintendent on *Cabbages*, *Endives* and *Beet* will be published in early numbers of the *Journal*.

Trials by the Floral Committee have been carried out of—*Gloxinias*, 80 varieties; *Abutilons*, 38 varieties; *Bouvardias*, 19 varieties; *Cannas*, 150 varieties; *Tuberous Begonias*, 72 varieties. Several charming new varieties of these last have been raised in the Garden, which, when propagated, will be distributed.

Trials have also been made of double ivy-leaved *Pelargoniums* and double-flowered zonal *Pelargoniums* in pots; and as bedding plants, of *Verbenas*, *Tropæolums*, and many varieties of *Annuals*, conspicuous among which may be named the varieties of the Chinese Pink. On all these subjects full reports will be published in the *Journal*.

The thanks of the Society are due to the numerous donors of plants and seeds, a full list of which is appended; and especially to the Director of the Royal Gardens at Kew; to H. J. Elwes, Esq., and W. Wilson Saunders, Esq., Col. R. Trevor Clarke, Baron von Mueller, of Melbourne, and Professor Sergeant, of the Harvard University, Boston, U.S.A.

The Council have great pleasure in announcing the encouraging fact that during the past year the distribution of plants, cuttings, and seeds, has been considerably in excess of that of any former year; many valuable plants, &c., some of which are new to cultivation, have been distributed from Chiswick to almost every part of the United Kingdom.

The following is a summary of the distributions of 1878, as compared with those of 1877:—

				Distributed in 1878.	Distributed in 1877.
Plants	...	...	...	5,250	1,695
Cuttings of Plants, Fruit, &c.				2,054 bundles.	715 bundles.
Strawberry Runners			...	2,500	...
Packets of Seed	...	...	...	22,500	15,850

In order to meet the wishes expressed by many of the Fellows of the Society, it has been arranged to include seeds of useful vegetables not ordinarily found in Trade Catalogues in the distributions of the coming season.

The Council again express their desire to open correspondence with foreign and colonial Horticulturists with a view to the exchange of plants and seeds, and they trust that the Fellows of the Society will assist them in carrying out so desirable an arrangement. Letters on this subject should be addressed to the Assistant Secretary, South Kensington.

At South Kensington several improvements have been effected in the Gardens. It has been necessary to supply new boilers both to the Palm House at Chiswick, and to the Conservatory at South Kensington.

The Fellows of the Society are aware that the last agreement entered into between H.M. Commissioners and themselves, with respect to the occupation of the South Kensington Gardens, terminated at Christmas last. Under this agreement H.M. Commissioners waived their right of re-entry until the close of the original term of occupancy, viz., June, 1892, provided the Society could, in the three years ending the 25th December, 1878, raise its annual income from subscriptions to £10,000. The efforts of the Council to fulfil this condition have failed; and the Commissioners have therefore the right to exercise their power of re-entry. No intimation has as yet been received from them that any substantial alteration in the occupation of the Gardens is at present intended; and the Council venture to hope that arrangements may be made by which the connection of the Society with these Gardens, in all those respects in which that connection has been beneficial to the best interests of the Society, may still be maintained. But whatever may be the ultimate decision of the Commissioners, the Council is convinced that no measure which they may resolve upon in the discharge of their trust as managers of the estate of which the Gardens form part, will be adopted without the utmost consideration to the fair claims of the Society and its position as a scientific association of established usefulness and eminence.

During the past year 197 free monthly tickets have been issued to Students in the Science and Art Schools, to enable them to pursue their studies from nature in the Gardens and Con-

servatory. The same privilege has always been accorded to properly accredited Artists.

The number of new Fellows elected in 1878 was 215, and of One Guinea Members, 36. There have been 97 resignations and 69 deaths; amongst the last the Society has to mourn the loss of the lamented Princess Alice, Grand Duchess of Hesse.

The number of resignations appears to be somewhat larger than usual; the list, however, includes many Fellows who had neither paid their subscriptions for 1876 and 1877, nor resigned, and who have since paid their arrears and removed their names. Several of these have since rejoined the Society.

The Society's list of Honorary Fellows has been strengthened by the election of His Majesty the King of the Belgians, K.G., who has most graciously accepted the honour, claiming to be not only a lover of Horticulture, but a practical Horticulturist. Several distinguished Foreign and Colonial Horticulturists have been elected Corresponding Members.

The Council feel the desirability, in the interests of Horticulture, of the closer co-operation of the various kindred associations throughout the country, and they will be glad to receive suggestions from Local Secretaries and others interested as to the best means of carrying out this object.

A legacy of One Hundred Pounds has been left to the Society by the will of the late Miss Parry, of Ham, for many years a Fellow. This amount has been invested in Consols, and placed in trust under the same conditions as those regulating the Davis Bequest.

ROYAL HORTICULTURAL SOCIETY.

BALANCE SHEET, 31st DECEMBER, 1878.

	£.	s.	d.		£.	s.	d.
To SUNDRY CREDITORS on open Account...	...	179	5	0	By CAPITAL	...	...
" LIFE COMPOSITION ACCOUNT	...	2166	2	0	" ANNUAL SUBSCRIPTIONS—Outstanding..	...	7171 12 9
" ADDITIONAL DEBENTURE (C. J. Freahe)...	5000	0	0	" SUNDRY DEBTORS —			361 4 0
" GENERAL REVENUE ACCOUNT				Garden Produce	...	...	183 0 1
Balance carried forward	...	859	16	7	" INVESTMENT—		
" LEGACY received from the late Miss Parry	...	90	0	0	3 per cent. Consols —£100 (Legacy Invested)		95 2 6
				" CASH AT BANKERS —			
				On Deposit Account		345 16 10	
				and Interest		138 2 11	
				On Current Account			
				" PETTY CASH IN HAND	...	...	483 19 9
							4 6
							<u>£8295 3 7</u>

We have examined the above Accounts with the Books and Vouchers, and find the same correct.

JOHN LEE,
JAS. F. WEST,
R. A. ASPINALL, } *Auditors*

SAML. JENNINGS,

Assistant Secretary.

January 31st, 1879.

ROYAL HORTICUL

Dr.

ANNUAL REVENUE ACCOUNT for

	£.	s.	d.	£.	s.	d.
To ESTABLISHMENT EXPENSES—						
Salaries	577	17	0			
Wages	231	0	1			
Printing, Stationery and Cards	168	18	2			
Postages	73	13	4			
Gas	17	12	0			
Library	4	3	5			
Miscellaneous	95	8	1			
				1,168	12	1
„ SPECIAL EXPENSES in relation to Horticulture—						
Journal	141	12	2			
Fruit and Floral Committees	86	16	4			
Editor of the Journal	100	0	0			
				328	8	6
„ CHISWICK GARDEN EXPENSES—						
Rent, Rates, Taxes, and Insurance	254	2	8			
Labour	974	6	8			
Implements, Manure, Coals, and Coke	335	1	3			
Repairs	108	1	2			
Trees, Plants, Seeds, &c.	30	15	0			
Superintendent's Salary	150	0	0			
Water	14	16	0			
Miscellaneous	79	6	5			
				1,946	19	2
„ KENSINGTON GARDEN EXPENSES—						
Rates, Taxes, and Insurance	416	13	1			
Superintendent's Salary	100	0	0			
Labour	421	0	6			
Repairs	112	2	3			
Coke and Manure	24	9	0			
Implements	1	0	6			
Water	40	7	5			
Reading Room	24	5	2			
Bands	162	13	9			
Miscellaneous	91	19	0			
				1,394	10	8
„ EXHIBITIONS—						
Advertising	279	10	5			
Prizes and Medals	734	1	0			
Bands	129	12	0			
Superintendent of Flower Shows	25	0	0			
Judges' Fees	13	13	0			
Sundries	167	15	7			
				1,349	12	0
„ BALANCE to GENERAL REVENUE ACCOUNT ...				6,187	12	5
				660	15	8
				£6,848	8	1

TURAL SOCIETY.

the YEAR ended 31st DECEMBER, 1878.

£.

									£.	s.	d.
By 1/15 LIFE COMPOSITIONS as at 1st January	...	...	...	...	...	...	...	...	676	18	0
„ ANNUAL SUBSCRIPTIONS	..	...	...	...	...	...	...	...	4,065	12	0
„ EXHIBITIONS	...	...	...	...	...	...	...	...	1,071	18	3
„ PROMENADES	...	...	...	...	...	...	...	...	69	5	0
„ DAILY ADMISSIONS	...	..	...	...	...	...	...	...	358	13	0
„ GARDEN PRODUCE	...	...	...	...	...	...	...	...	424	8	8
„ PACKING CHARGES	..	...	...	...	...	...	...	...	20	1	7
„ MISCELLANEOUS RECEIPTS	...	...	...	...	...	...	...	...	60	15	10
„ “DAVIS BEQUEST.”—Interest appropriated under pro- visions of Trust towards Prize Medals	...	...	...	...	...	...	...	...	89	16	4
„ INTEREST ON BANK DEPOSIT ACCOUNT	...	..	...	...	...	...	...	...	10	19	4

£6,848 8 1

SAML. JENNINGS,

Assistant Secretary.

We have examined the above Revenue Account with the Books and Vouchers, and find the same correct,

January 31st, 1879.

R. A. ASPINALL,
JOHN LEE,
JAS. F. WEST, } *Auditors.*

ROYAL HORTICULTURAL SOCIETY.

Dr. GENERAL REVENUE ACCOUNT, 31st DECEMBER, 1878. Cr.

	£.	s.	d.		£.	s.	d.
To ANNUAL SUBSCRIPTIONS—Arrears Account for Subscriptions in Arrear which have either lapsed, or in other ways become irrecoverable, or which have been carried off at time of pay- ment to Credit of Current Subscriptions ...	663	17	6	By BALANCE OF REVENUE ACCOUNT brought forward 1st January, 1878	522	18	5
				„ ANNUAL REVENUE ACCOUNT— Balance for the year 1878	660	15	8
To BALANCE carried forward as per Balance Sheet	859	16	7	„ SUSPENSE ACCOUNT— As per Balance Sheet, 31st December, 1877, transferred to Revenue, being cash received from H. M. Commissioners for overpaid taxes and interest thereon	340	0	0
				By BALANCE carried forward ...	£1523	14	1
					£859	16	7

We have examined the above Account with the Books and Vouchers, and find the same correct,

R. A. ASPINALL,
JOHN LEE,
JAS. F. WEST, } *Auditors.*

31st January, 1879, SAMUEL JENNINGS,
Assistant Secretary,

FEBRUARY 11, 1879.

SCIENTIFIC COMMITTEE.

Rev. M. J. BERKELEY in the Chair.

Cocoa-nut Beetle.—Mr. MacLachlan reported on the beetle which had been referred to him for examination at the last meeting, as having caused so much damage to the Cocoa-nut Palms in Zanzibar by eating and destroying the terminal bud or cabbage, and consequently killing the tree. The beetle in question is *Oryctes monoceras*. Dr. Kirk, who sent the specimen, stated that the insect appeared in Zanzibar after a hurricane, which is the more interesting, as the species has been found in Reunion by Dr. Coquerel, where, he says, it was so common at one time that fears were entertained that they would destroy every cocoa-nut palm on the island. Dr. Kirk said that this beetle only fed upon living vegetable matter, consequently if the trees affected were cut down at once the insect would die; there was, however, one small species of the same genus in this country which feeds on dead vegetable matter, *O. nasicatoris*, being found in tan pits. Mr. MacLachlan recommended that the trees which appeared to be affected should be cut down and burnt. It was not difficult to tell them, for when the leaves unfold they are invariably imperfect. He did not know any means of getting the grub out of the tree.

Pentlandia miniata.—Col. Trevor Clarke exhibited bulbs of this plant which showed flower. They had been grown in the open ground beneath a light, and then dug up and removed to a greenhouse. He had found that the bulbs would not flower in the open border, but if dug up, as just stated, they then flowered freely.

Snowdrops.—Dr. Masters showed a flower of the Dunrobin Seedling, raised by Mr. Melville; also an early flowering form, and some of the ordinary kind for comparison. All were planted, some in the open border, others in a cold frame, on September 17th. The early flowering variety was found in bloom on February 3rd, when the snow and ice melted away, so that the plants had been in flower for some time beneath the snow. The Dunrobin Seedling flowered on February 9th, while a dwarf

late variety planted on the same day is not yet in flower. Further remarks on these plants will be given on a subsequent occasion.

Eupomatia laurina.—A flower of this interesting shrub was exhibited by Mr. W. Bull.

Cucumber Disease.—Specimens from Earlswood of this mysterious disease were exhibited. Mr. MacLachlan thought there had been insects at the root. Col. Trevor Clarke said that change of soil was sometimes found to be efficient. He thought a sandy loam was the best soil for cucumbers. The Chairman said there had been much advice on the subject, but nothing yet that he knew of was sufficient to prevent or cure the disease.

Outgrowth from Stem of Passiflora quadrangularis.—A singular hypertrophied condition of the stem of this plant was exhibited, and referred to Rev. M. J. Berkeley for further examination and report.

Disease in Ash.—Mr. Sydney Webb remarked upon the paper contributed to the last number of the Society's Journal by Mr. W. W. Saunders, on the canker in Ash trees, so commonly met with. He thought that further light could be thrown upon the subject; he believed that the disease was to be attributed in the first instance to injuries inflicted by the larva of a moth, *Prays Curtisellus*. Mr. Saunders had only looked for *cancer* or cankerous external growth, and of course found no traces of insect action in shoots of the third year's growth; but had he looked for insect action in the younger growth he would have found it. It was well known that trees with smooth bark were very tender and easily eaten into; he had noticed many instances of the kind in which canker had set up where there had been traces of the moth; he thought that the insect track killing the portion down which it ran caused a gap in the bark letting in damp, and that other influences such as exudation of sap, insects, American blight, &c., supervened until the cankerous wound hid the original cause from view. He instanced cases of canker in the Apple and Peach traceable to injuries effected by insects in support of his argument. Mr. McLachlan thought it had been generally considered that the larva named by mining down the pith of the young shoot destroyed it in its entirety, causing it first to droop and then to

die. Mr. S. Webb did not allege that such was not the case in certain instances, but he asserted that *Prays Curtisellus* was not exclusively a miner down the centre of the shoot, but frequently down one or other flat side under the bark, that these shoots were those that by rapid growth either entirely or partially shook off the insect action, but showed the results of it in after life.

FLORAL COMMITTEE.

Medals Awarded.—Silver Floras to Messrs. Osborn and Sons, for a group of Flowering Plants; to Mr. J. Wills, for a miscellaneous collection of Foliage and Flowering Plants; and to Messrs. J. Veitch and Sons, for a group of Forced Shrubs, etc., in flower. Small Gold Banksian to Mr. W. Bull, for a group of Orchids and new and rare plants. Silver Banksian to Mr. B. S. Williams, for a group of plants (Primulas, etc.)

First-class Certificates were awarded to *Rubus rosifolius*, var. *coronarius*, from Mr. C. Green (gardener to Sir George Macleay), and to *Cyphokentia macrocarpa*, from Mr. W. Bull.

Votes of Thanks were passed to Mr. C. Green for cut flowers of *Dahlia Maximilliana* and *Sparmannia africana*; to Mr. H. Parr, for cut flowers of *Poinsettia pulcherrima*, Seedling Abutilons, and *Begonia glaucifolia*; to Mr. J. George (gardener to Miss Nicholson), for cut flowers of Seedling Abutilons; and to Mr. H. Cannell, for cut blooms of Pelargoniums.

FRUIT COMMITTEE.

A Silver Gilt Knightian Medal was awarded to Mr. C. Haycock (gardener to R. Leigh, Esq.), for a collection of Apples and Pears.

Votes of Thanks were passed to Lewis A. Killick, Esq., for a collection of Apples; and to Messrs. T. Rivers and Son, for a collection of Apples (49 varieties).

THE LATE PRINCESS ALICE,

Grand Duchess of Hesse Darmstadt.

In accordance with a resolution of the Council, the following address of condolence was sent to Her Majesty the Queen by Lord Aberdare, the President of the Society.

To Her most gracious Majesty the Queen—

We, the President, Vice-President, and Members of the Council of the Royal Horticultural Society, beg to approach your Majesty with the offering of our loyal and heart-felt sympathy in the painful bereavement recently suffered by your Majesty and the Royal Family by the death of your beloved Daughter the Princess Alice, Grand Duchess of Hesse Darmstadt, who had endeared herself to all your Majesty's subjects by her noble qualities and genuine devotion to the good of all around her.

We are deeply sensible how little words can do to lighten the bitterness of such a loss, but your Majesty's sorrow touches the heart of every one of your devoted subjects, and the Society we represent has received so many proofs of your Majesty's favour and interest that we cannot refrain from expressing our profound sympathy with an affliction which many circumstances have concurred to render especially poignant and trying.

On behalf of the Council,

(Signed)

ABERDARE.

Duffryn, Aberdare,

President.

22nd January, 1879.

The following acknowledgment was received from General Ponsonby, dated Osborne, 25th January, 1879 :—

Dear Lord Aberdare,

I am commanded by the Queen to request that you will return to the Vice-President and Members of the Council of the Royal Horticultural Society, and to accept yourself Her Majesty's sincere thanks for the kind and feeling expressions of sympathy with the Queen in her sorrow contained in the address you have transmitted to Her Majesty.

(Signed)

HENRY F. PONSONBY.

MARCH 11, 1879.

ORDINARY GENERAL MEETING.

Lord ALFRED S. CHURCHILL, V.P., in the Chair.

Fellows Elected.—Messrs. Bassett, C. Brown, W. J. Browne, C. J. A. Coote, F. Douglas, J. Groom, F. G. Heath, A. Larke, W. See, H. M. Pollett, J. Robinson, F. W. Wood, and Mrs. Wyllie.

Medals Awarded.—Large gold Banksian to Mr. H. B. Smith, for a group of Cyclamens. Silver-gilt Banksians to Mr. C. Edmonds, for group of Cyclamens; and to Mr. W. Bull, for group of new and rare plants. Silver Banksians to Mr. R. Clarke, for group of Cyclamens; to Mr. B. S. Williams, for groups of Primulas and Cyclamens; and to Messrs. Osborn and Sons, for a miscellaneous group of plants. Silver Floras to Mr. H. Benham, gardener to the Earl of Stradbroke, for four *Phalænopsis Schilleriana*; and to Messrs. W. Paul and Son, for a collection of Camellias, cut blooms. Small Gold Banksian to Sir Trevor Lawrence, Bart., M.P., for a group of Orchids. Silver Knightian to Mr. S. Ford, gardener to W. E. Hubbard, Esq., for a collection of Apples and Pears.

On this occasion a fine display of Orchids and Cyclamens completely filled the large conservatory, and attracted a large attendance of Fellows and visitors. Mr. Jennings, in addressing the Meeting, alluded to the interesting circumstance that the value of the certificates accorded by the Society was being recognised by some of the foreign nurserymen. Mr. Van Geert, of Ghent, had submitted a beautiful semi-double *Azalea indica*, named "*Empress of India*"; and Messrs. Hovey and Co., of Boston, U.S.A., exhibited some charming cut Camellias, remarkable for the almost entire absence of the notch at the point of the petals which usually detracts from perfection of form in most other varieties. This well-known Boston firm also showed a specimen of *Azalea (amæna) Hoveyi*, a rosy lilac variety from Japan, noted for its hardness and for the earliness and profusion of its bloom.

Sir Trevor Lawrence staged a magnificent group of Orchids, in which every specimen was a picture of health and beauty, and every species shown in its best variety, notably some grand examples of *Dendrobium Wardianum*, *Dendrobium luteolum*, from Burmah, with pale creamy flowers; *D. crassinode* and *D. nobile cærulescens*, covered with bloom; *Cymbidium eburneum*, bearing eight pure white flowers; *Lælia harpophylla*, with its remarkably bright orange scarlet spikes, a rare specimen; and many fine examples of *Odontoglossums*, *Cœlogynes*, *Cypripediums* and *Phalænopses*.

From Messrs. J. Veitch and Sons came a choice collection of Primulas, Cyclamens and Orchids, amongst the last a plant of

Lælia Veitchii, a cross between *Cattleya labiata* and *C. crispa*. Messrs. Hugh Low and Co. showed the grand new *Cymbidium Lowianum*, which had been imported as *C. giganteum*, which it closely resembles when out of bloom; it bears, however, a long spike of green flowers with faint brownish lines; the labellum is richly blotched with purple. A very fine specimen of *Phalænopsis Schilleriana* was exhibited by the Earl of Stradbroke.

Referring to a cut flower of *Vanda Cathcartii* shown by Mr. Green, gardener to Sir George Macleay, Mr. Jennings mentioned that several years ago, when this fine Vanda was first discovered, it was described as found in the dense shade of the Sikkim forests, where but little sunlight penetrated. Its growth was noticed to be weak and its stems almost succulent, and it proved a very bad traveller. Some years after its discovery, when it became necessary to clear these thick forests for Cinchona cultivation, it was found that masses of *V. Cathcartii* were growing on the tree tops exposed to the full sunlight. These plants were of quite a different habit from the miserable specimens previously introduced, which had evidently been growing under disadvantages, and this noble Orchid is now comparatively plentiful and quite as hardy as any of the Himalayan Vandas.

SCIENTIFIC COMMITTEE.

Sir JOSEPH HOOKER, C.B., &c., in the Chair.

Androgynous Mistleto.—Rev. George Henslow reported on a monœcious specimen of Mistleto, received from Mr. Corderoy, of Didcot, as follows:—One of the specimens of Mistleto sent is a branch from a female plant. The central shoot is elongated, nearly leafless, and with half ripe berries. From the base proceed two tufts of much shorter branches, the smaller of the two being exclusively male, the larger exclusively female. The few berries on the latter are riper than those on the main whip-like extremity. A careful section through the point of junction with microscopical examination clearly proves the plant to be in an *androgynous* condition, for the section shews the central woody fibres penetrating down directly into the main stem. At one point the new wood bulged out, giving a deceptive appearance of parasitism, but a further section proved this to

be merely local. The clean sharp line of demarcation seen in ordinary parasitic Mistleto on apple or other wood is entirely wanting.

The plant from which the above branch was cut is, I understand from Mr. Corderoy, about twenty years old, and of three to four feet in diameter. It grows on an apple tree, and is the sole instance of such *androgynism* on that tree, which, however, bears several other Mistleto plants.

Mr. Corderoy states that the other specimens sent were female shoots which appeared on male plants; but as the specimens handed to me had been unfortunately mutilated, I cannot add further details.

It is perhaps worth noticing that the character of the above described specimen is exactly the reverse of one mentioned by Dr. Masters, in his *Vegetable Teratology*, p. 509, of which he says :—"The plant was of the male sex, with numerous long slender whip-like branches, with large broad yellowish leaves and fully developed male flowers at the end." From the base of this, he says, proceeded a tuft of short female branches.

In the example sent by Mr. Corderoy the whip-like branches are female, but no distinction of leaf is to be seen; nor is any difference to be relied upon between the foliage of the male and that of the female plants of *Viscum album* generally.

In the case he has described, Dr. Masters has also concluded that it was due to *androgynism* and not to *parasitism*.

Gumming in Orange Trees.—Dr. M. C. Cooke exhibited twigs of Orange trees from Florida covered with a resinous exudation, which it was supposed might be analogous to the gumming of fruit trees.

Vegetable Remains from Ancient River Gravels.—Mr. Worthington G. Smith returned to this subject. He stated that he had obtained results from the Valley of the Lark, near Bury St. Edmunds, similar to the remains previously found by him in the gravels of the Lea and Axe; they consisted of leaf fragments, seeds, rootlets, hairs, and fragments of bone. Exactly similar results had followed his minute examination of breccia from the bone-cave near the village of Les Eyzies, in the Valley of Vézère, Dordogne. This breccia afforded fragments of plant-stems (grasses), minute splinters of wood and bone, and numerous hairs. Mr. Smith exhibited the wood,



Excrescence from Stem of
"SEQUOIA SEMPERVIRENS."

bone, and hairs under the microscope; the cells and vessels were distinct in the wood, and the lacunæ with their canaliculi in the bone. Some of the hairs belonged to rodents, others were unknown. From the same breccia Mr. Smith exhibited a broken fossil lateral-incisor human milk-tooth, belonging to a subject of about seven years of age.

Excrescence from Stem of Sequoia sempervirens.—Dr. Masters showed from Mr. Sim, of Foot's Cray, some huge woody dilatations of the lower part of the stem of this plant, regarding which the following letter was read:—"The *Sequoia sempervirens* sent were, I find, planted as cuttings in the autumn of 1867. I have had a further batch of them lifted, and find that there are some straight well-formed trees similarly malformed at the root. It appears that about half of the batch, including well-formed trees, are in like condition. Some of the tallest

normal-rooted trees are 8 feet to 9 feet high. I have measured the root-ball of one straight tree of 6 feet in height, and find it (the ball) 16 inches in circumference. The soil of the spot is a poor light loam on gravel. Some years ago, in transplanting a large bed of seedling *Cupressus Lawsoniana*, one was noticed—and it is preserved here—with a similar protuberance at what nurserymen call the collar. In this example there is a clear space between the roots and the swelling. I will have one of these *Sequoias* planted again to see, if I am spared, whether this bulbous development will increase, and whether the tree will continue as it is, comparatively fibreless in proportion to its size and age." No information was forthcoming from the Committee on the subject. A wood-cut of this singular deformity is annexed.

Fruit of Fischeria.—Dr. Masters also showed a large four-winged downy follicle containing numerous seeds surmounted by a tuft of silky hairs. The fruit was collected in New Granada, and was sent to Mr. Alfred Borwick. The fruit was evidently that of an *Asclepiad* allied to *Fischeria*, but in the absence of further evidence the exact genus could not with certainty be determined.

Pods of the Ironwood of Brazil.—Sir J. Hooker showed legumes of *Cæsalpinia ferrea*, the tree said to produce the very hard and little known Ironwood of Brazil.

Disease in Stem of Robinia.—Mr. Wilson Saunders sent some beautiful drawings and a manuscript description of a peculiar disease in the stem of *Robinia pseudo-acacia*, which appears, with illustrations, in this number of the Journal.*

Vanda suavis.—Mr. Jennings called attention to a plant of this species shown in the conservatory, and in which the inflorescence was terminal, instead of axillary, as usual.

Action of Frost on Clay.—Mr. Jennings made some remarks on the peculiar cleavage shown by clay when subjected to frost, the clay breaking up into more or less cubical masses, to the great detriment of the roots of the plants growing in it. Sir Joseph Hooker remarked that the action of frost on different soils was a complicated matter, and that on it depended to a large extent the amount of injury inflicted on plants by frost. Thus in some parts of the garden at Kew in 1866 the ground

* See page 169.

at some distance beneath the surface continued frozen up to June, so that the plants had their roots in frozen earth while their tops were burnt with the sun, to the great destruction of the plants. At Sion, the effects of the same frost were very different, mainly owing to the different character of the soil.

Photographs of Victorian Scenery.—Mr. Jennings exhibited, on the part of Mr. R. Roskilly, some beautiful photographs representing scenes in the forests of Victoria, and showing the immense size to which not only the Eucalypti grow, but also the Tree Ferns.

Plants, &c., Exhibited.—Rev. Harpur-Crewe showed flowers of *Botryanthes alpestris*, *Scilla sibirica*, *Crocus Imperati*, *C. corsicus* and *C. minimus*. Mr. Elwes sent *Hyacinthus Elwesii* (?), *Galanthus Elwesii*, *G. Imperati*, *G. plicatus* and *G. nivalis*. From Mr. Ware came some new forms of Himalayan primrose, *P. rosea*, Kashmir. A singular Japanese Azalea, *A. macrosepalum*, of Maximoviez, was shown, remarkable for its calyx lobes nearly equalling its corolla, and for its white flowers with pink stamens; *Anomatheca cruenta*, *Sarchochilus* sp., *Dendrobium* sp., and other plants were also shown.

FLORAL COMMITTEE.

First Class Certificates were awarded to Amaryllis "*Virgil*," from Messrs. J. Veitch and Sons; to *Ipsea speciosa*, from Mr. H. Heims (gardener to F. A. Philbrick, Esq., Q.C.); to Azalea (indica) "*Empress of India*," from Mr. A. van Geert; to *Cymbidium Lowianum*, from Messrs. H. Low and Co.; and to *Cyclamens (persicum)* *picturatum*, and "*Crimson King*," from Mr. H. B. Smith.

Cultural Commendation to Primula "*Mrs. Holland*," from Mr. W. Tidy.

Votes of Thanks were passed to Mr. H. Heims, for *Odontoglossum Andersonianum*; to Mr. J. James (gardener to W. F. Watson, Esq.), for Cinerarias, cut blooms; to Mr. C. Green (gardener to Sir G. Macleay), for cut flowers of *Vanda Cathcartii*, *Odontoglossum crispum*, var. *Macleayi*; and *Stiffia chrysantha*; to H. J. Buchan, Esq., for cut flowers of Orchids; to Messrs. J. Veitch and Sons, for miscellaneous group of plants; to Mr. H. Cannell, for cut blooms of Pelargoniums and *Fuchsia cordifolia splendens*, cut specimen.

FRUIT COMMITTEE.

Votes of Thanks were passed to Mr. McRobie, for Seedling Apple; to L. A. Killick, Esq., for collection of Potatos (24 varieties); and to Mr. S. Ford, for collection of Apples and Pears.

MARCH 25, 1879.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice-President, in the Chair.

Elections.—Hon. H. Brougham, J. C. Brown, M.P., G. H. Browning, Mrs. E. MacMorland, C. E. G. Phillips, W. Radford, Mrs. A. Spencer, and Mrs. E. S. Young.

Medals Awarded.—Large Gold Banksians to Messrs. J. Veitch and Sons for collection of Hyacinths, and to Mr. J. Wills and Mr. W. Bull for groups of plants. Small Gold Banksians to Mr. J. W. Moorman (gardener to the Misses Christy) for group of Hyacinths, Tulips, &c.; and to Mr. J. Wills for group of plants arranged for effects. Silver-gilt Banksians to Messrs. Osborn and Sons for collection of Hyacinths; to Mr. B. S. Williams for group of plants, to Messrs. Paul and Son for group of Roses in pots, and to Mr. J. Roberts (gardener to Baron L. de Rothschild) for group of Orchids and Amaryllis. Silver Banksians to Messrs. W. Cutbush and Son for group of Hyacinths and Tulips; to Messrs. Osborn and Sons for group of plants; to Mr. R. Dean for group of spring-flowering plants; to Messrs. W. Paul and Son for collection of Camellias, cut blooms; to Messrs. C. Lee and Son for group of plants, and to Mr. J. Aldous for group of plants.

Upon this occasion the Society was honoured by the presence of His Majesty the King of the Belgians, who was received at the north-west entrance by Lord Aberdare and the Members of the Council. His Majesty spent more than an hour in examining the various groups and objects of interest, and expressed himself greatly pleased at the beautiful exhibition which, in spite of the inclemency of the weather, had been gathered together.

Amongst the most remarkable groups staged were Messrs. J. Veitch and Sons' extensive display of Hyacinths, 300 in

in number, including about 80 new varieties; to some fine examples of which the Floral Committee awarded First Class Certificates. Mr. Smith's splendid bank of Cyclamens was a noticeable feature; also another fine collection sent by Mr. Edmonds. Groups of miscellaneous plants were exhibited by Mr. W. Bull, Mr. Wills, Messrs. Paul and Son, Cheshunt, Messrs. Cutbush and Son, Mr. R. Dean, of Ealing, Messrs. C. Lee and Son, B. S. Williams, Osborn and Sons, and Jas. Carter and Co. Mr. Aldous exhibited a very elegant example of floral dinner-table decoration, and Mr. R. Parker an interesting group of early spring flowering plants.

SCIENTIFIC COMMITTEE.

Sir JOSEPH HOOKER, K.C.S.I., in the Chair.

Plants Shown.—Mr. Elwes showed specimens of *Arisama nepenthoides* from Sikkim, with a curiously mottled and three-lobed spathe; also a Tulip from Turkestan, resembling *T. Kaufmanni* (Regel), except in the colour of the flower-segments, which in the present case were primrose-yellow externally, rich golden within; it was stated to be very early. *Tulipa triphylla*, *Chionodoxa Forbesii*, and two forms of *Erythronium*, the smaller being *E. purpurascens* and the other true *E. americanum*.

Fasciated Ruscus.—Dr. Masters called attention to a very interesting specimen of fasciation in the stem of this plant, the changes extending even to the phyllodes. The specimen was sent by Mr. Thomson, of the Crystal Palace Gardens, and will be presented to the Museum at Kew.

Galls on Leaves of Galium sp.—Dr. Masters showed from Baron Von Mueller some curious cylindrical larva cases, or galls, on the leaves of an Australian species of *Galium*, or *Asperula*. The leaves were replaced by cylindrical, blackish, thick-walled tubes, covered with stout hooked bristles, the unaffected leaves being all but destitute of such appendage. The specimen was referred to Mr. MacLachlan.

Miscellanea.—Specimens of Vine roots affected with *Phylloxera* were shown. A pamphlet of Professor Sarjents' on the desirability of planting the *Catalpa* as a timber tree was alluded to, but it was pointed out that in this country the wood did not ripen sufficiently to admit of its having the valuable qualities assigned to it in America. Sir J. Hooker did not think it would

pay to grow it here, it would be cheaper to import it. Mr. Clapham sent specimens of *Trichomanes* in various stages, and which were referred to Dr. Masters for examination and report.

FLORAL COMMITTEE.

First-Class Certificates were awarded to *Primula rosea*, from Mr. Ware; to *Galanthus nivalis*, var. *Melvillei*, from Mr. D. Melville (gardener to the Duke of Sutherland); to Rose (Tea) "*Madame Alexandre Bernaix*," from Mr. C. Turner; to *Davidsonia pruriens*, from Mr. W. Bull; to Camellias, "*Mrs. A. M. Hovey*" and "*C. M. Hovey*," from Messrs. Hovey & Co.; to Hyacinths, *Salmon King*, *King of Reds*, *Leviathan*, and *The Sultan*; and Amaryllis "*Mrs. Baker*," from Messrs. J. Veitch and Sons; to Azalea "*Duke of Connaught*," from Mr. B. S. Williams; and to Cyclamen "*Queen of the Belgians*," from Mr. H. B. Smith. Cultural Commendation to *Lycaste Skinneri cerina*, from Mr. W. Bull. Votes of Thanks were passed to Mr. G. Thomson, for a fasciated specimen of *Ruscus androgynus*; to Mr. Z. Stevens (gardener to the Duke of Sutherland), for *Odontoglossum Andersonianum* var.; to G. F. Wilson, Esq., F.R.S., for *Primula concolor*; and to Mr. C. Green (gardener to Sir G. Macleay), for cut of flowers *Salvia albo cœrulea*, *S. elegans*, and *Prostanthera lasianthos*.

FRUIT COMMITTEE.

A Vote of Thanks was passed to L. A. Killick, Esq., for 60 varieties of Apples.

APRIL 8, 1879.

ORDINARY GENERAL MEETING.

Colonel R. TREVOR CLARKE in the Chair.

Elections.—John Barton, Richard F. Fisher, Mrs. E. Foster, Hon. Mary Grant, D. Guilineuf, Lt.-Col. Hatton, E. Kennedy, Miss Kennedy, Col. G. H. Moncrieff, F. A. Philbrick, Q.C., W. A. Soames, Hon. Mrs. Toler, R. G. Wylde.

Medals Awarded.—Large Gold Banksians to Messrs. J. Veitch and Sons, for collection of Amaryllis, &c., and to Sir Trevor Lawrence, Bart., M.P., for a group of Orchids. Small Gold Banksian to Mr. B. S. Williams for group of plants. Silver Banksians to Messrs. Paul and Son, for Roses in pots and cut blooms of Roses; and to Mr. W. Bull, for group of plants;

to Messrs. Barr and Sugden, for collection of Daffodils; and to Mr. J. Woodbridge, gardener to the Duke of Northumberland, for specimen in flower of *Cyrtopodium punctatum*.

The Exhibition upon this occasion was of more than ordinary interest; perhaps never before had so extensive a collection of Amaryllis been got together; from Messrs. J. Veitch and Sons came a group of three hundred unnamed seedlings; and from Mr. Williams a smaller collection of choice varieties. The Prizes offered by an Amateur for the best new light and dark seedlings were for competition, but did not produce any novelties; the only specimen considered worthy of a prize was a variety named "*Thomas Speed*," raised at Chatsworth; a rich scarlet, medium size, fine form, and with six flowers to the truss, with a white instead of the usual green centre, and a crimson ring round the base of the stamens. Mr. Little also exhibited six very choice seedling Amaryllis.

Orchids were very strong, Sir Trevor Lawrence sending a splendid group, which included a grand specimen of *Masdevallia Harryana*; also *Phalænopsis Schilleriana*, *Dendrobiums*, *Devonianum*, *Jamesianum*, *thyrsiflorum* and *crassinode*, *Oncidium concolor*, *Cymbidium Lowianum*, and many others.

In Mr. Bull's group were several very fine *Cypripediums*, *Odontoglossums*, and *Masdevallias*; *Cymbidium eburneum*, *Dendrobium Falconeri*.

Mr. Veitch showed the new *Dendrobium Brymerianum*, from Burmah, &c., with its remarkably fine fringed labellum, and Mr. Williams some very large plants of *Vandas tricolor*, *insignes* and *suavis*.

Mr. Jennings, in addressing the Meeting, directed attention to a most complete group of cut Hellebores, exhibited by Mr. Barr, comprising examples of nearly all the varieties in the second section of Mr. Baker's monograph of Helleborus, viz., those without leaves below the inflorescence, called by him "*Acaules*," and consisting of three distinct species, viz., *H. niger*, *H. viridis*, and *H. orientalis*. The first of these, the well known Christmas rose, was not then in bloom, but of the other two species there were innumerable varieties which so blend into each other that identification is rendered most difficult. *H. viridis* was a most interesting species, but none of its varieties were valued for gardening purposes, the flowers not

being conspicuous ; still, as they continue in bloom all through the spring at a time when there is scarcely anything else, when variety in form and hue is doubly valuable, they were worthy of being better known. The foliage of *H. viridis* is more delicate than that of *H. orientalis*, which will survive the winter. The best of the *viridis* section is *H. laxus*, a native of Carinthia, in Austria ; this and *H. dumetorum*, *H. gracilis*, *H. Bocconi*, which last is an Italian variety, have drooping sea-green cup-like flowers. *H. graveolens* is found all the way from Vienna to Trieste ; the exterior of the sepals is slightly tinged with purple. *H. erubescens* is somewhat similar.

In *H. purpurascens*, a native of Hungary, the sepals are of a deep dove colour outside and a paler tint within ; roundish and beautifully imbricated, forming the main difference between this variety and *H. cupreus*, which is not imbricated. A third variety is *H. intermedius*, which differs from *H. purpurascens* in the colour of the inside of the sepals, which is rich sea green.

The more important species for decorative purposes was *H. orientalis*, the flowers of which were larger, showier, and more attractive. Many seedlings had been raised abroad, and bore fancy names, though they differ but slightly in character. Some of the Berlin seedlings bore very high sounding names, such as "*Hofgarten Inspector Hartwig*," "*Frau Irene Heinemann*," &c., &c.

Amongst the varieties of *H. orientalis* might be named the following :—*H. abchasicus*, a plant described and figured by Regel in the "*Garten Flora*," but which has not been recognized by Mr. Baker, nor is it known to Mr. Barr, though many varieties are sold under this name which do not agree with the figure ; *H. atroroseus*, *H. atrorubens*, similar, only of a darker shade ; *H. colchicus*, a mottled variety ; *H. fulvens*, *H. lividescens*, *H. rubellus*, *H. rubidus*, in which the petals are also purple, and *H. ruber*. All the above have purple sepals.

Of the white flowering section, *H. antiquorum*, in which the flowers die off green ; *H. olympicus*, the sepals of which are bright green outside and pure white within ; *H. guttatus*, a perfectly white form of *H. olympicus*, and *H. pallidus*, quite distinct, with elongated sepals.

H. cyclophyllus, a green flowered variety, is classed by Mr. Baker under *H. viridis*, but Mr. Moore, in a recent note on the

Hellebores, pronounces it to be a form of *H. orientalis* on account of the enduring character of its foliage. Specimens of most of the above varieties were shown by Mr. Jennings during the course of his remarks.

SCIENTIFIC COMMITTEE.

Sir J. D. HOOKER, K.C.S.I., in the Chair.

Excrescence from Passiflora.—The Rev. M. J. Berkeley reported on a curious excrescence on the stem of *Passiflora quadrangularis*, which was sent to the Committee on February 11. It consisted of a very rough tuberculated mass, six inches in diameter, and about five inches long, occupying three-fourths of the stem, evidently bursting through the bark and pushing it on one side. Delicate thread-like rootlets were here and there developed from the tubercles, and two decided roots, one of which was affected exactly in the same way as the stem. Above the mass was an elliptic disc about $1\frac{1}{2}$ inch long, swelling out from the stem, and clearly the origin of a new mass. On an examination, first, of one of the minute tubercles on the above-mentioned root, and afterwards of one of the larger tubercles, they were found to consist of large irregular cells mixed with scattered or fascicled tubes with very thick walls, consisting of concentric layers and pierced with narrow passages, the larger cells filled with starch granules, which become very dark in colour when treated with a solution of iodine. On examination of the younger portions of the bark the same structure was observed, and the same abundance of starch granules. A section through the disc showed a similar mass, mixed with deep red spots, in which either the cells themselves or the intercellular passages were gorged with coloured matter, which, however, did not wear exactly the appearance which is so common in diseased tissues when change has been produced by the presence of fungoid threads. The wood itself consists of a mass of large tubes with intermediate cellular tissues, but the tubes have not the same structure as the young bark, or it may be the Alburnum, so far as can be judged from the specimen before us. It is, however, so continuous with the bark, that it seems rather to belong to it than the wood. Whichever it may belong to, the mass is beyond doubt an over-development or hypertrophy of this part of the stem, and is certainly one of the most curious instances we have

met with. It calls to mind the excrescences which are not uncommon at the base of the stem of *Pelargoniums*; but we do not mean to assert that their nature is precisely the same.

Trichomanes alatum.—Dr. Masters reported that he had examined the specimens sent by Mr. Clapham, and found that the fronds produced small viviparous bulbs (he saw no reason why, under certain conditions, any fern should not produce them), which in an early stage presented much of the appearance of prothallia, but on a microscopic examination of these no trace of sexual organs, antheridia and archegonia, could be found.

Insect Pests.—The Chairman showed specimens of Vines from Mr. Nation, grown in Peru, and which were said to be attacked by a beetle. Also specimens of a bug found in imported specimens of *Welwitschia*. Both specimens were referred to Mr. MacLachlan for report.

Hyacinthus orientalis, &c.—Mr. Elwes showed specimens of the wild form of the common Hyacinth from the Taurus, and which was interesting as showing the great advance that had been made by the art of the gardener.

Lachenalia hyacinthina (?)—Mr. Elwes also showed a peculiar blue-flowered *Lachenalia* (?) with a somewhat two-lipped flower and declinate stamens. The specimen was referred to Kew for identification.

Tortuous Hazel.—Mr. W. G. Smith showed a remarkable specimen, in which the branches had anastomosed one with another, so as to form a series of loops.

Hybrid Geranium.—Mr. Grieve sent specimens of a plant with the foliage of *Geranium pratense* but more divided than usual and with a yellowish tinge. It was supposed to be the result of the influence of the pollen of a *Pelargonium* on *Geranium pratense*, but the evidence as to the cross is incomplete.

New Aroid.—Mr. Bull sent a remarkable Aroid with the foliage of an *Amorphophallus*, from New Grenada. The specimen was referred to Kew for identification.

Chionodoxa Lucilia.—Fine specimens of this, grown in the open ground, were sent by Mr. Maw, the introducer of the plant, together with the following letter:—

“As the collector and introducer of this plant, and having been the first to flower it in cultivation, I think a few lines from my own pen may give more information about it than is at

present known. I must first correct an error of nomenclature, having distributed some bulbs under the name of *C. Forbesii*. Dried specimens of nearly allied species, especially of bulbous plants, are often difficult to determine, and those submitted to Mr. Baker were badly dried and shrivelled, roughly pressed at the time of collecting in a pocket-book; hence it is that the Lycian species, *C. Forbesii*, has been confounded with the western Anatolian *C. Luciliae*, from the mountains of the east of Smyrna. I have also a second species from Crete, for which I am indebted to Mr. Sandwith, H.M.'s Consul, of less beauty than the Anatolian plants. These I believe are the only two species that have ever been in cultivation. *Chionodoxa Luciliae* I first gathered out of flower on the flanks of the Taktalie Dag, at a height of from 2,500 to 4,000 feet, and I could not at the time distinguish it from one of the numerous species of *Scilla* which abound in Levant. I obtained with it out of flower, *Scilla bifolia*. On my second day's excursion from the little Turkish village of Taktalie, which I had made my headquarters for the examination of the interesting range of mountains, including the Taktalie and Nymph Dag, I ascended to the summit of the latter mountain, and just as we were returning, my Greek and Turkish attendants became botanically excited and beckoned me to a spot a little way off at an altitude of about 4,300 feet—a bank-side thickly covered with *Chionodoxa Luciliae*, the most brilliant floral display I ever beheld—a bright mass of blue and white, resembling *Nemophila insignis* in colour, but even more intense in effect, and round about it was a complete garden of bulbous plants, including a small yellow *Fritillary*, *Colchicum bulbocodoides*, two or three species of Tulips, some yellow Gages, Croci, and great tufts of *Galanthus Elwesii*, with leaves half a yard long. Of *Chionodoxa Luciliae* as a highly decorative and perfectly hardy plant I can speak with great confidence. The roots dug up in 1877 flowered but sparingly last year, but notwithstanding the late severe winter the patches out of dcors have fully recovered their transplantation, and are flowering as well as in their native habitat, forming the most brilliant tufts, in which the foliage is almost hidden by the masses of flowers, which tell out as bright spots in the spring garden, some of the scapes bearing from eight to ten flowers one inch in diameter. I have had it in flower for

nearly a month in the cold frame, where it attains a higher stature, though not quite so rich in colour as the flowers produced in the open air. For pot culture and forcing I believe it will be very useful, and take a prominent place amongst early decorative plants. It produces seed very freely, and will, therefore, be capable of ready multiplication. I obtained with the typical blue form a few bulbs of a pretty pure white variety. I send herewith some specimens flowered in the open air from bulbs collected in 1877, which have been in the open ground the last two winters. *George Maw, F.L.S.*"

Hymenocallis macrostephana. — The following note from Mr. Woodbridge was read by Dr. Masters:—

"I was very pleased to see a description of this plant by Mr. Baker in the *Gardeners' Chronicle* of last week (p. 430). Having grown it for several years I can fully endorse Mr. Baker's statement that 'it forms a valuable accession to our stock of cultivated stove *Pancratieae*.' And I am decidedly of opinion that when it becomes more generally known it will be as extensively cultivated as the *Eucharis amazonica*, to which perhaps, from a gardener's point of view, it may most readily be compared. I think in some respects and for some purposes it will prove even more valuable than that well-known and highly-appreciated plant. The scent I fancy is sweeter, and the form of the flower more elegant, while it is equal if not superior in the delicate pureness of its colour. It is also a continual blooming plant. We have it in flower here almost every month in the year, but more especially in the winter months, when white flowers are most valuable. Mr. Baker says that 'it flowers in February and March,' and probably that is its most natural time of flowering, but mode of the treatment may account for its flowering at other times of the year. The bulbs readily throw out offsets, and these if not separated from but grown with the parent bulb, and shifted into larger pots as required, give flowers at different times of the year according to their various sizes, so that with a few well filled pots of the various sized bulbs a succession of blooms is easily obtained. The same result may possibly be obtained by separating and growing them singly; but this I have not proved. They grew well in the same house and under the same treatment as the *Eucharis*. *John Woodbridge, Syon House Gardens, Brentford.*"

The Chairman remarked that he had received this plant from two or three places lately.

A Botanical Certificate was awarded to Mr. Woodbridge.

In reference to the two last-mentioned plants a discussion arose as to the propriety of more systematically and thoroughly carrying out a plan for awarding certificates to plants and specimens which the rules of the Floral Committee preclude under existing circumstances from receiving an award. It was suggested that a sub-committee might be appointed to take into consideration such cases, so as to prevent the anomaly of really interesting plants being passed over because not shown according to the rules laid down for the guidance of the Floral Committee and to prevent the seeming unfairness to amateurs and introducers of new, rare or interesting plants. Considerable discussion ensued, but no definite action was taken.

FLORAL COMMITTEE.

First-class Certificates were awarded to *Dendrobium Brymerianum* and *Amaryllis "Duke of Connaught,"* from Messrs. J. Veitch and Sons; to *Chionodoxa Lucilia*, from G. Maw, Esq., and Messrs. Barr and Sugden; to *Calogyne ocellata maxima*, from Mr. B. S. Williams; to *Masdevallia bella* and *Dendrobium crassinode album* from Sir T. Lawrence, Bart., M.P. Cultural Commendations to *Mackaya bella*, cut specimens, in flower, from Mr. C. Green, gardener to Sir George Macleay; to *Cyrtopodium punctatum*, in flower, from Mr. J. Woodbridge; and to *Echinocactus myriostigma*, from Mr. H. Boller. Votes of thanks were passed to Hon. and Rev. J. T. Boscawen, for cut trusses of Rhododendrons; to J. T. D. Llewelyn, Esq., for Seedling Primula; to Mr. C. Green, for *Dendrobium suavisissimum*; to Mr. H. Heims, gardener to F. A. Philbrick, Esq., Q.C., for cut flowers of *Odontoglossum nebulosum pardinum superbum*; to Mr. H. Boller, for *Pilocereus senilis*; to G. F. Wilson, Esq., F.R.S., for cut flowers of Primroses; to Mr. R. Parker, for group of Hardy Plants; to Mr. J. Wiggins, gardener to H. Little, Esq., for collection of Cinerarias; to Messrs. C. Lee and Son, for group of Plants; to Messrs. W. Cutbush and Son, for cut blooms of Camellias and Epacris; to Messrs. Osborn and Son, for group of Plants; to Mr. R. Dean, for group of Spring-flowering Plants; and to Mr. J. Aldous, for group of Plants.

APRIL 22, 1879.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice-President, in the Chair.

Elections.—Robert N. Batt, H. J. W. Cox, Miss F. E. Fawcett, T. W. Lewis, Henry Merryweather, Mrs. Merryweather, Miss Ratliff, Mrs. C. Scholefield, Charles St. Barbe, Mrs. C. Ernest Tritton, and Robert Wigram.

Medals Awarded.—Large Gold Banksians to Mr. W. Bull, for a group of New and Rare Plants, and to Messrs. Paul and Son, for a group of Roses in pots. Small Gold Banksian to Mr. B. S. Williams, for a group of Plants. Silver Gilt Floras to Messrs. William Paul and Son, for Cut Roses, and to Messrs. James Veitch and Sons, for a group of Roses in pots, &c. Silver Floras to Messrs. W. Cutbush and Son, for a group of Plants, and to Messrs. Charles Lee and Son, for a group of Plants. Bronze Banksian to Captain Pittern, for a group of Hyacinths and Tulips.

An extensive and interesting display of plants was made on this occasion in the conservatory, Mr. William Bull's group of Cycads, Palms, and Orchids being greatly appreciated. Messrs. Paul and Son, of Cheshunt, sent a fine group of Pot Roses, each specimen being in remarkably fine condition. Messrs. William Paul and Son also staged a fine collection of Pot Roses. Orchids were exhibited by Messrs. Veitch and Sons and Mr. B. S. Williams. Mr. Barr's cut blooms of Narcissi were quite a feature.

The attractions of this meeting were enhanced by the Annual Show of the National Auricula Society (Southern Section), which was held upon this occasion, and furnished the main subject of Mr. Jennings' remarks. The Assistant Secretary also directed attention to several new and interesting plants shown in the groups, amongst which may be named *Asparagus plumosus*, from South Africa, an elegant climbing plant, with delicate fern-like foliage, and *Hibiscus rosa sinensis schizopetalus*, with singular deeply fringed petals.

SCIENTIFIC COMMITTEE.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair.

Insects in Welwitschia.—Mr. MacLachlan reported that the insect found in the *Welwitschia* had been submitted by him to a specialist, who pronounced it to be *Odontopus searpunctatus*; its nearest ally in this country was *Pyrrhocoris aptera*, a plant-feeding bug, occasionally found in Devonshire, but in profusion over the Continent. It was a singular circumstance that the English specimens but seldom develop wings. Mr. Edgeworth remarked that bugs of this character are very common in India, especially on species of *Asclepias*, which are very poisonous to other creatures.

Insects in Grape Vines from Peru.—Mr. MacLachlan reported that, after cutting up the pieces of Vine wood, his opinion was confirmed that the insects found were the results rather than the cause of the disaster. There were two species, both members of the order *Bostrichidæ*, the larger one being a *Bostrichus*, the smaller a *Rhizopertha*; he exhibited specimens which were still alive; he had also found some of the larvæ alive in the wood. Both these insects fed upon dead vegetable matter rather than living. They are found in this country feeding upon dead wood, and it was more than doubtful if the insects were therefore the cause of the damage.

Insects in Bamboo.—Mr. MacLachlan stated that the larvæ attacking Bamboos in India, as forwarded by Mr. Routledge, were those of a boring beetle belonging to the *Bostrichidæ*. He had sent them to the British Museum, but had not been able to ascertain the species. Mr. MacLachlan received the thanks of the Committee for the valuable information he had afforded.

The Coffee Disease.—Dr. M. C. Cooke alluded to the measures taken in Ceylon to destroy the fungus (*Hemileia vastatrix*), and which promised to be successful. Dr. Cooke had recommended the use of sulphur, as used in the case of the Vine and Hop mildew, and stated his belief that its use in this case would soon entirely destroy the fungus. He also recommended, with the use of sulphur, a thorough cleansing of the ground beneath. Dr. Masters thought that this information was most interesting to

the Committee, for it would show how valuable was the work done by them.

Plants Exhibited.—From Mr. Bull came an Orchid, *Liparis* (?), which will be referred to Professor Reichenbach for identification. Messrs. Veitch showed a *Lycaste*, named by Professor Reichenbach *L. Locusta*. From Messrs. Veitch also came a very remarkable form of *Hibiscus rosa sinensis*, called *schizopetalus*, with deeply fringed petals like those of a *Clarkia*. The Chairman remarked on the analogy between these petals and the “compound” stamens of Mallows. Mr. G. F. Wilson showed a *Primula* under the name of *P. ciliata*, and which was referred to Dr. Masters for further report. The Hon. and Rev. J. T. Boscawen sent flowers of a fine variety of *Cattleya Skinneri*; and Mr. Jennings showed flowers of *Cypripedium humile*, a native of North America.

Spores of Dry Rot (?).—Mr. MacLachlan showed specimens of a fine dust covering woodwork, crockery, &c., and which appeared to be the spores of some fungus. Referred to Dr. Cooke for examination and report.

Root Growth.—Dr. Masters laid before the Committee the results of some experiments made by him on the development of roots and root-hairs on plants grown under varying conditions of soil, &c., and made some comments thereon. The paper is published in the *Journal* of the Society.* A vote of thanks was passed to Dr. Masters for his valuable communication.

FLORAL COMMITTEE.

First-class Certificates were awarded to *Primula platipetala plena*, *Lalia flammea*, *Asparagus plumosus*, *Hibiscus rosa sinensis schizopetalus*, and *Glonera jasminiflora*, from Messrs. J. Veitch and Sons; to *Primula platipetala plena*, from Messrs. Paul and Son and Mr. R. Dean; to *Lilac alba grandiflora*, from Mr. W. Denning (gardener to Lord Londesborough); to *Gloxinia “Mrs. Bause,”* from Mr. J. Wills; to *Primula ciliata* var. *purpurata*, from G. F. Wilson, Esq., F.R.S.; to *Hymenocallis macrostephana*, from Mr. J. Woodbridge (gardener to the Duke of Northumberland); and to *Narcissus incomparabilis albidus expansus* (Leeds), from Messrs. Barr and Sugden.

* See page 173.

Votes of Thanks were passed to Mr. C. Green (gardener to Sir George Macleay), for *Echium Decaisneanum*; and to Messrs. Hooper and Co., for a collection of Pansies.

FRUIT COMMITTEE.

Cultural Commendations were awarded to Black Alicante Grapes, from Mr. J. Atkins (gardener to Col. Loyd Lindsay); to Mr. W. Ravenhill (gardener to Alderman F. Sidney), and to Mr. W. Messon (gardener to A. Meadows, Esq.), for Strawberries "*President*."

A Vote of Thanks was passed to Mr. L. A. Kellick, for Apples "*Sturmer Pippin*."

MAY 13, 1879.

ORDINARY GENERAL MEETING.

ARTHUR GROTE, Esq., Vice-President, in the Chair.

Elections.—C. J. Bethell, Mrs. Bowman, U. J. Burke, E. Edwards, E. Fountain, E. R. Gray, Lieut.-Col. C. Ives, Hon. Mrs. C. Ives, W. H. Mare, T. W. C. Master, Jun., M.P., W. Napier, F. W. Procter, Lieut.-Gen. C. C. Shute, M.P., Mrs. Thomas, and A. C. Trevor.

Medals Awarded.—Silver Gilt Flora to Messrs. J. Veitch and Sons, for a group of Plants. Silver Floras to Mr. B. S. Williams, for a group of Plants, and to Messrs. H. Lane and Son, for a group of Rhododendrons. Silver Banksians to Mr. J. Wills, for a group of Plants; to Messrs. C. Lee and Son, for a group of Plants; to Messrs. Paul and Son, for Cut Roses; to Messrs. W. Paul and Son, for Cut Roses; to Mr. R. Dean, for Spring Flowers; to Messrs. J. and J. Hayes, for a group of Pelargoniums; and to Messrs. Hawkins and Bennett, for a group of Pelargoniums, &c.

Fine groups of Clematis, Azalea mollis, Rhododendrons, and Orchids, from Messrs. Jas. Veitch and Sons; and a remarkable group of new Dracænas from Mr. B. S. Williams, contributed

to render the display in the Conservatory most attractive. There were also several other interesting collections of new and rare plants. Mr. R. Dean showed a fine group of varieties of *Primula amœna*. Messrs. Paul and Son and William Paul and Son displayed some splendid blooms of Roses; and Messrs. Barr and Sugden's show of cut Narcissi attracted much attention; decorative groups were also staged by Messrs. C. Lee and Son, Mr. J. Wills, Messrs. Hayes and Co., Messrs. Hawkins and Bennett, Messrs. Osborn and Sons, and Mr. J. Aldous.

The Assistant Secretary, in addressing the meeting, remarked that few plants were easier to grow and more satisfactory in their results than the several species of *Primula*, which had all been greatly improved during the last few years. From the common Primrose, *P. vulgaris*, and the old crimson variety, *P. v. auriculæflora*, had sprung numerous beautiful forms; so also from *P. veris*, the Cowslip, had been derived the Oxlip Primrose and the varieties of *Polyanthus*. On the last occasion had been seen the advances made in the cultivation of *P. auricula*, and now we were shown the progress which had been effected with the Oriental species from China and Japan. Many of the new species recently introduced by Mr. Elwes, from the Himalayas, were under distribution to Fellows from Chiswick. He showed a plant of *P. sikkimensis*, as a type of the Indian species. The parent of the many forms of Japanese *Primulas* exhibited by Mr. Dean was *P. amœna*, which had been introduced some fifteen or sixteen years before by Mr. J. G. Veitch, but there had always been considerable difficulty in raising seedlings from it; the pods would form, but never ripen; but a few years ago success was achieved simultaneously by three cultivators, Mr. Dean, Mr. Allan, and M. Lemoine; almost the entire stock of the two former gentlemen was exhibited at this meeting, and M. Lemoine's were very similar. *P. amœna* never affords seed, but the white variety, *P. amœna alba* does, hence the varieties. The plants are perfectly hardy, but if grown out of doors, lose their foliage in Winter and bloom later in the Spring. If it is desired to propagate them the soil should be shaken away from the roots when the foliage dies down, and the crowns separated; but if left quite undisturbed the plants will throw up grander heads of bloom. Out of a

hundred seedlings, ninety-nine will probably be "pin-eyed," in the flowers of which the pollen is so hidden as to be almost inaccessible; very few indeed turn out "thrum-eyed." Crossing between *P. veris* and *P. vulgaris* (*acaulis*) had often been successfully accomplished; he was not aware that *P. vulgaris* and *P. auricula* had ever been crossed. There were many natural hybrids which had sometimes been incorrectly introduced as new species; for example: *P. variabilis*, which would appear to be a cross between *P. officinalis* and *P. grandiflora*; so also the Himalayan forms, which varied considerably.

Regarding the collection of Narcissi, Mr. Jennings remarked that there were about twenty species, all of them European; they also were so closely intermixed that it had become most difficult to determine species. This had been easily proved by experiment.

Dean Herbert had stated that *N. pseudo Narcissus* crossed with *N. poeticus* would produce a variety of *N. incomparabilis*; this again crossed with *N. poeticus* would produce the variety now known as *N. Barri*, a decided step towards the true "pheasant eye." Successive similar crossings would bring the true *N. poeticus* back again. *N. poeticus* had two groups of distinct habit: the one early flowering, the other not coming into bloom till a month later. The learned Dean seemed to have worked mainly with the former section; but amongst the many followers who devoted themselves to the improvement of the Narcissus, two gentlemen made their mark upon the genus, viz., Mr. Backhouse, of Weirsdale, and Mr. Leeds, of Manchester, whose crossings produced the intermediate group already alluded to, *N. Barri* and subsequently *N. Burbidgei*, a closer approach to *N. poeticus*, but flowering a fortnight earlier, and *N. incomparabilis* (*white*) crossed with *N. montanus* afforded *N. Leedsi*. *N. Maclei* had never been collected, but it is so very distinct that it was difficult to imagine it other than a true species. Dean Herbert maintains that *N. Sabini* is a natural variety, but Mr. Barr says that it is a garden hybrid, which has been produced both in England and on the Continent by crossing *N. Maclei* with *N. bicolor*; but the same cross will also produce *N. Nelsoni*, which is a compromise of *N. Sabini*. Mr. Jennings' remarks were illustrated by flowering specimens of nearly every variety alluded to.

SCIENTIFIC COMMITTEE.

Sir J. D. HOOKER, C.B., in the Chair.

Fungus Spores.—Dr. Cooke reported that the specimens referred to him at the last meeting, and which were deposited as dust over household utensils, were not the spores of the dry rot, but of some unknown fungus.

Salep.—Dr. Cooke exhibited a series of specimens of tubers of various species of Orchid used as salep in India and Turkey, and imported without any further information by which the identity of the species could be determined. Mr. Elwes remarked that when he was in Asia Minor, he had sent out Turks to gather similar tubers, and he had seen two large baskets full collected in a couple of hours.

Eurotium on Cocoa Husk.—Mr. Schofield showed Cocoa husk with a species of *Eurotium* growing thereon.

Plants Exhibited.—By Sir George Macleay (gardener, Mr. Green): A plant of *Bowia volubilis*, an Asparagus-like plant, with a bulb from which only one or two true leaves are formed; the rare purple-spotted Australian Orchis, *Dipodium punctatum*. By Mr. Elwes: The yellow *Viola biflora*; the Portuguese *Iris subbiflora*, concerning which it was noted that, while in its native country the plant flowers in autumn, and it did so here also the first year, yet the plant exhibited, which was a seedling grown in this country, was flowering in spring; *Tulipa saxatilis*, a lovely Cretan species, with flowers of a pale lilac colour with a rich yellow centre; *Arnebia echioides*, a showy herbaceous boragineous plant, with pale primrose yellow flowers, marked in the sinuses between the petals with purple spots, which are very conspicuous when the flowers first open, but which disappear subsequently; in the morning they are bright, by noon they fade, and next day they are scarcely visible. It was remarked that this was contrary to the ordinary course of things, the sun and light being the usual source of colour. *Fritillaria olympica*, *F. Ehrhartii*, or *F. macrandia*, from Syria; *Streptopus roseus*, from North America; *Muscari conicum*, the most free flowering of the species; *Corydalis bracteata*, a fine species, with leafy bracts, and large pale yellow flowers, in aspect like those of a *Linaria*; and lastly, three species of *Arisæma* from Sikkim, singular Aroids, one of which had a

solitary, long-stalked, ternately divided leaf, a purple-striped spathe, and a spadix prolonged at the tip into a very long, terminal, thread-like process. This thread-like process is, in the young state, according to Mr. Elwes, enclosed within the central segment of the leaf which is rolled round it; hence, if any injury befall the leaf-segment before it is expanded, this thread-like process is liable to be injured also.

Monstrous Primroses.—Dr. Masters showed various specimens, upon which he proposed to report more fully at the following meeting; the most remarkable was a hose-in-hose form, fasciated, from Mr. Cannell.

Fruit Blossoms Injured by Frost.—Dr. Masters showed from Mr. Earley specimens of fruit blossoms, including Apple, injured by frost, on which a further report was promised.

Vegetable Ivory.—Mr. MacLachlan showed fruits of a Palm from the Friendly Isles, *Sagus amicarum*, the nuts of which are used as vegetable ivory, but are not so highly valued as those of the *Phytelephas*.

Insects Injurious to Pears.—Dr. Denny showed specimens of a small dipterous insect supposed to be injurious to Pear blossom, and which were referred to Mr. MacLachlan for identification.

Fungus on Flower Bed.—Arthur Grote, Esq., exhibited a specimen of a fungus from a flower-bed. Mr. Worthington Smith pronounced this to be the *Xylaria vaporaria* of Berkeley, which he had illustrated in the *Gardeners' Chronicle*, 1871, p. 482, under the name of *X. pedunculata*, Fr.

Cucumber Disease.—Specimens of this well known but little understood pest were exhibited.

Awards to Plants of Botanical Interest.—A communication was read from Mr. Wilson Saunders in reference to plants worthy of recognition by the Society, but which, as not being in commerce, or likely to become commercially important, were apt to be overlooked. Mr. Saunders' suggestion was to the effect that a small sub-committee, selected from the members of the Floral and Scientific Committees, might be appointed to deal with this subject. Dr. Denny remarked that substantially this course was already followed.

Meal on Auricula Leaves.—Mr. Jennings asked if anything

was known as to the nature and purport of this exudation; he observed that plants covered with this Meal if submerged, did not retain any water upon them, and suggested that its economic value was perhaps to prevent an accumulation of moisture, or possibly, to protect the plant from excessive radiation. Mr. Elwes remarked that the wild *Auricula* had it.

FLORAL COMMITTEE.

First-class Certificates were awarded to Croton "*Princess of Wales*," *Ranunculus Lyalli*, *Azalea (pontica) narcissiflora*, and *Azalea (mollis)* "*Comte de Gomer*," from Messrs. J. Veitch and Sons; to Primula "*Golden Gem*," from Messrs. Osborn and Sons; to *Cupania elegantissima*, *Dracæna superba*, and *Amaryllis* "*Mrs. Morgan*," from Mr. B. S. Williams; to Begonia (double) "*Comtesse H. de Choiseul*," from Messrs. J. Laing and Co.; to Polyanthus (duplex) "*Prince of Orange*," from Mr. R. Dean; to *Selaginella Kraussiana aurea*, from Mr. Donaldson; and to *Arnebia echioides*, from H. J. Elwes, Esq.

A Botanical Commendation was awarded to H. J. Elwes, Esq., for *Arisæma speciosa*.

Highly Commended: *Mammillarias fufifera* and *formosa*, from Mr. H. Boller.

Cultural Commendation to *Odontoglossum vexillarium*, from Mr. W. Reeves (gardener to C. Hart, Esq.)

Votes of thanks were passed to Mr. W. Reeves, for cut flowers of Orchids; to Mr. C. Green (gardener to Sir G. Macleay), for Terrestrial Orchids and cut flowers; to Messrs. Barr and Sugden, for cut flowers of *Narcissi*; and to Messrs. Osborn and Sons, for a group of Plants.

FRUIT COMMITTEE.

A First-class Certificate was awarded to a Melon, "*Devonshire Early*," from J. Jaques (gardener to J. D. Perrins, Esq.)

Cultural Commendation to Figs "*Brown Turkey*" and *Grosse Monstrueuse de Lipari*, from Mr. W. Pratt (gardener to Viscount Hill).

MAY 27, 1879.

THE GREAT SUMMER SHOW.

The Annual Exhibition of the Society was upon this occasion a decided advance, both as to extent and general character, upon all former shows. Never before had such Roses been seen at any Flower Show. The sensation created by Mr. Chas. Turner, of Slough, last year, had evidently spurred the leading rose growers to extraordinary efforts, and the chief prizes were most vigorously contested.

The Exhibition was visited during the day by several members of the Royal Family. Her Royal Highness the Princess of Wales, who was accompanied by the Crown Prince of Denmark, was received by Lord Aberdare, the President of the Society, and the Members of the Council, and by them conducted through the tents. The Royal party was subsequently joined by their Royal Highnesses the Duke and Duchess of Edinburgh, the Crown Prince of Sweden, the Count and Countess of Flanders, and the Duke of Teck.

In the great tent was, as usual, a remarkable display. The Roses of Mr. Turner, Messrs. Paul and Son, Cheshunt, Messrs. H. Lane and Son, Great Berkhamstead, and Messrs. James Veitch and Sons, were magnificent. A novel effect was produced by the last named firm, whose group of Roses was most artistically interspersed with Maples of various shades of foliage. Messrs. Jackman's group of Clematis comprised about fifty of the finest specimens ever exhibited, and well merited the Gold Medal awarded to it. Several very fine decorative displays were made, that of Mr. Wills earning the first prize, Mr. Aldous, Messrs. J. Laing and Co., and Messrs. J. Peed and Sons also exhibiting most effective groups. Messrs. Ivery and Son's group of Indian Azaleas was exceedingly fine; so also were Mr. Rann's Ferns. A splendid bank of Odontoglossums from Mr. W. Bull deserves special mention, and Mr. B. S. Williams's group of rare plants and exotic ferns attracted considerable interest.

The long tent was well filled with miscellaneous collections—Azaleas from Mrs. Torr, Mr. R. Thornton, and Mr. D. Martineau; Rhododendrons from Messrs. H. Lane and Son; new plants from Mr. Bull, Mr. Williams, and Mr. Wills;

Orchids from Mrs. Torr, Mr. Whitbourn, Mr. H. James, and Messrs. T. Jackson and Son; Cacti from Mr. Boller; Pelargoniums from Messrs. Turner and Watson; and cut Roses from Messrs. W. Paul and Son.

The show of fruit and vegetables was moderate in extent, but, considering the unfavourable season, exceedingly good in quality, the Strawberries being especially good. There was also a very good show of garden implements and appliances.

The weather was most unfavourable, heavy rain falling during the whole period. The number of visitors on each day, exclusive of Fellows, holders of Fellows' tickets, and complimentary cards, was as follows :—

May 27	...	...	...	...	...	...	1,466
„ 28	...	...	...	...	...	...	4,223
„ 29	...	...	...	...	...	...	3,460
„ 30	...	...	...	...	...	...	4,565
Total number of visitors							13,714

The following is the official list of awards made :—

AWARDS OF THE JUDGES.

CLASS 1.—12 STOVE or GREENHOUSE PLANTS, in flower, distinct. (Open.)

1st, Messrs. T. Jackson and Son, The Nurseries, Kingston-on-Thames, £15.

2nd, Messrs. J. Peed and Sons, Roupell Park Nurseries, Norwood Road, S.E., £10.

CLASS 2.—8 STOVE or GREENHOUSE PLANTS, in flower, distinct. (Nurserymen.)

1st, Messrs. T. Jackson and Son, Kingston-on-Thames, £10.

2nd, Messrs. J. Peed and Sons, Norwood, £7.

CLASS 3.—8 STOVE or GREENHOUSE PLANTS, in flower, distinct. (Amateurs.)

1st, Mrs. Torr, Garbrand Hall, Ewell (J. Child, Gr.), £10.

2nd, D. Martineau, Esq., South Road, Clapham Park (J. Weston, Gr.), £7.

CLASS 4.—15 ORCHIDS, distinct. (Open.)

1st, F. Whitbourn, Esq., Loxford Hall, Ilford (J. Douglas, Gr.), £20.

2nd, Mr. H. James, Castle Nursery, Lower Norwood, £15.

3rd, Messrs. T. Jackson and Son, Kingston-on-Thames, £10.

CLASS 5.—10 ORCHIDS, distinct. (Amateurs.)

1st, Mrs. Torr, Ewell (J. Child, Gr.), £10.

2nd, F. Whitbourn, Esq., Ilford (J. Douglas, Gr.), £7.

CLASS 6.—10 ORCHIDS, distinct. (Nurserymen.)

1st, Mr. B. S. Williams, The Nurseries, Upper Holloway, N., £8.

2nd, Mr. H. James, Lower Norwood, £6.

CLASS 7.—GROUP of ODONTOGLOSSUMS. (Open.)

1st, Mr. W. Bull, King's Road, Chelsea, S.W., £6.

CLASS 8.—12 NEW PLANTS introduced since the year 1876. (Open.)

- 1st, Mr. W. Bull, Chelsea, £8.
- 2nd, Mr. J. Wills, South Kensington, S.W., £6.
- 3rd, Mr. B. S. Williams, Upper Holloway, N., £4.

CLASS 9.—8 GREENHOUSE AZALEAS, distinct. (Nurserymen.)

- 1st, Mr. C. Turner, Royal Nursery, Slough, £10.
- 2nd, Messrs. T. Jackson and Son, Kingston-on-Thames, £7.
- 3rd, Mr. J. Wills, South Kensington, S.W., £5.

CLASS 10.—8 GREENHOUSE AZALEAS, distinct. (Amateurs.)

- 1st, Mrs. Torr, Ewell (J. Child, Gr.), £12.
- 2nd, R. Thornton, Esq., The Hoo, Sydenham Hill, S. (A. Ratty, Gr.), £9.
- 3rd, D. Martineau, Esq., Clapham Road, S.W. (J. Weston, Gr.), £7.

CLASS 11.—15 GREENHOUSE AZALEAS, in pots not exceeding 12 inches in diameter. (Open.)

- 1st, R. Thornton, Esq., Sydenham, S. (A. Ratty, Gr.), £8.
- 2nd, Messrs. J. Ivery and Son, Dorking, £6.
- 3rd, Mr. C. Turner, Slough, £4.

CLASS 12.—8 ERICAS, distinct. (Open.)

- 1st, Messrs. T. Jackson and Son, Kingston-on-Thames, £10.
- 3rd, Messrs. B. Peed and Son, Norbury Nurseries, Lower Streatham, £7.

CLASS 13.—8 FINE-FOLIAGED PLANTS. (Amateurs.)

- 1st, J. Warren, Esq., Handcross Park, Sussex (C. Rann, Gr.), £10.
- 2nd, Rev. Canon Bridges, Beddington House, Beddington (T. N. Penfold, Gr.), £7.
- 3rd, J. G. Megaw, Esq., Windermere House, Upper Norwood (J. Ford, Gr.), £5.

CLASS 14.—GROUP of FINE-FOLIAGED PLANTS, arranged in a space not exceeding 300 square feet. (Open.)

- 1st, J. Warren, Esq., Handcross, Sussex (C. Rann, Gr.), £12.
- 2nd, Messrs. Hooper and Co., Covent Garden, W.C., £8.

CLASS 15.—GROUP of MISCELLANEOUS PLANTS in bloom, arranged in a space not exceeding 300 square feet. (Open.)

- 1st, Mr. B. S. Williams, Upper Holloway, N., £12.

CLASS 16.—GROUP of MISCELLANEOUS PLANTS, arranged for effect, and occupying a space not exceeding 300 square feet. (Open.)

- 1st, Mr. J. Wills, South Kensington, W., £15.
- 2nd, Messrs. J. Laing and Co., The Nurseries, Forest Hill, S.E., £10.
- 3rd, Messrs. J. Peed and Sons, Norwood, £7.
- Extra, Mr. J. Aldous, Florist, Gloucester Road, S.W., £10.

CLASS 17.—9 SHOW PELARGONIUMS, distinct, in pots not exceeding eight inches in diameter. (Open.)

- 1st, W. F. Watson, Esq., Redlees, Isleworth (J. James, Gr.), £9.
- 2nd, Mr. C. Turner, Slough, £6.

CLASS 18.—9 FANCY PELARGONIUMS, distinct, in pots not exceeding eight inches in diameter. (Open.)

- 1st, W. F. Watson, Esq., Isleworth (J. James, Gr.), £8.

CLASS 19.—GROUP of not less than 30 GLOXINIAS in pots. (Open.)

- 1st, Mr. John Wills, South Kensington, W., £4.
- 2nd, C. Hart, Esq., Beaufort House, Lee (W. Reeves, Gr.), £3.

CLASS 20.—GROUP of not less than 20 TUBEROUS BEGONIAS, in pots. (Open.)

- 1st, Messrs. J. Laing and Co., Forest Hill, S.E., £6.
- 2nd, Messrs. Hooper and Co., Covent Garden, W.C., £4.
- 3rd, Messrs. T. Jackson and Son, Kingston-on-Thames, £2.

CLASS 21.—6 STOVE or GREENHOUSE FERNS, distinct. (Amateurs.)

- 1st, Mrs. Torr, Ewell (J. Child, Gr.), £8.
- 2nd, J. Warren, Esq., Handcross, Sussex (C. Rann, Gr.), £6.
- 3rd, F. Whitbourn, Esq., Ilford (J. Douglas, Gr.), £4.

CLASS 22.—6 STOVE and GREENHOUSE FERNS, distinct. (Nurserymen.)

- 1st, Mr. B. S. Williams, Upper Holloway, N., £6.

CLASS 23.—20 ROSES, distinct, in pots. (Open.)

1st, Messrs. Paul and Son, Cheshunt, £15.

2nd, Mr. C. Turner, Slough, £10.

3rd, Messrs. H. Lane and Son, Great Berkhamstead, £7.

CLASS 24.—9 ROSES, distinct, in pots. (Nurserymen.)

1st, Mr. C. Turner, Slough, £15.

2nd, Messrs. Paul and Son, Cheshunt, £10.

CLASS 25.—6 ROSES, distinct, in pots. (Amateurs.)

1st, Miss Christy, Kingston-on-Thames (J. W. Moorman, Gr.), £6.

2nd, Mr. J. Tranter, Henley-on-Thames, £4.

3rd, W. F. Watson, Esq., Isleworth (J. James, Gr.), £2.

CLASS 27.—GROUP of not less than 30 RHODODENDRONS.

1st, Messrs. H. Lane and Son, Great Berkhamstead, £10.

CLASS 28.—GROUP of not less than 30 HARDY HERBACEOUS PLANTS, in pots, distinct. (Open.)

1st, Mr. Robert Parker, Tooting, £8.

CLASS 30.—GROUP of HARDY FLOWERS, cut blooms, arranged in separate bunches. (Open.)

1st, Mr. Robert Parker, Tooting, £2.

2nd, Messrs. Hooper and Co., Covent Garden, W.C., £1.

CLASS 31.—CUT BLOOMS of not less than 24 PANSIES, distinct. (Open.)

1st, Mr. H. Hooper, Vine Nursery, Widcomb Hill, Bath, £2.

2nd, Mr. H. Catley, Claverton Buildings, Bath, £1.

CLASS 32.—2 PINE APPLES. (Open.)

2nd, The Duke of Richmond and Gordon, Goodwood (F. Rutland, Gr.), £1 10s.

3rd, Mrs. Torr, Ewell (J. Child, Gr.), 15s.

1st, Withheld.

CLASS 33.—1 PINE APPLE, "Queen." (Open.)

1st, The Duke of Richmond and Gordon, Goodwood (F. Rutland, Gr.), £1.

3rd, Mrs. Torr, Ewell (J. Child, Gr.), 10s.

2nd, Withheld.

CLASS 34.—1 PINE APPLE, "Smooth Cayenne." (Open.)

1st, Lord Carington, Wycombe Abbey, Bucks (G. T. Miles, Gr.), £1.

CLASS 35.—1 PINE APPLE, any other variety. (Open.)

1st, The Duke of Richmond and Gordon, Goodwood (F. Rutland, Gr.), £1.

CLASS 36.—3 BUNCHES of BLACK HAMBURGH GRAPES. (Open.)

1st, Mrs. Tristram, Fowley, Liphook (P. Edwards, Gr.), £3.

2nd, Marchioness of Camden, Bayham Abbey, Lamberhurst (W. Johnstone, Gr.), £2.

3rd, D. McIntosh, Esq., Havering Road, Romford (W. Bones, Gr.), £1 10s.

CLASS 38.—3 BUNCHES of WHITE MUSCAT of ALEXANDRIA GRAPES. (Open.)

1st, C. Allhusen, Esq., Stoke Court, Slough (J. Maher, Gr.), £3.

CLASS 39.—3 BUNCHES of WHITE GRAPES, any other variety. (Open.)

1st, Col. Loyd Lindsay, Wantage (J. Atkins, Gr.), £2.

2nd, Mrs. Tristram, Liphook (P. Edwards, Gr.), £1 10s.

CLASS 40.—6 PEACHES, any one kind. (Open.)

1st, C. Allhusen, Esq., Slough (J. Maher, Gr.), £2.

CLASS 41.—6 NECTARINES, any one kind. (Open.)

1st, C. Allhusen, Esq., Slough (J. Maher, Gr.), £1 10s.

2nd, Dr. Fuller, New Shoreham, (J. Nash, Gr.), £1.

CLASS 42.—2 DISHES of CHERRIES, distinct. (Open.)

1st, Lord Carington, High Wycombe (G. T. Miles, Gr.), £2.

CLASS 43.—1 DISH of CHERRIES. (Open.)

1st, Lord Carington, High Wycombe (G. T. Miles, Gr.), £1.

CLASS 44.—3 DISHES of STRAWBERRIES, distinct. (Open.)

1st, The Marquis of Salisbury, Hatfield (G. Norman, Gr.), £2.

2nd, T. Somers Cocks, Esq., Marlow (A. G. Bridgeman, Gr.), £1 10s.

CLASS 45.—1 DISH of STRAW-BERRIES. (Open.)

- 1st, Messrs. Barnwell and Tilbury, The Graperies, Worthing, £1.
 2nd, The Marquis of Salisbury (G. Norman, Gr.), 15s.
 3rd, The Duke of Richmond and Gordon, Goodwood (F. Rutland, Gr.), 10s.

CLASS 46.—1 MELON. (Open.)

- 1st, Col. the Hon. C. R. D. Hay, Sunning Hill (C. Deavin, Gr.), £1.
 2nd, T. Taylor, Esq., Tetsworth, Oxon (J. Chilton, Gr.), 15s.
 3rd, Mr. G. Goldsmith, Tonbridge, 10s.

CLASS 47.—1 DISH TOMATOS. (Open.)

- 1st, R. B. W. Baker, Esq., Romford (W. Iggulden, Gr.), £1.
 2nd, Lord Carington, High Wycombe (G. T. Miles, Gr.), 15s.
 3rd, The Duke of Richmond and Gordon, Goodwood (F. Rutland, Gr.), 10s.

CLASS 48. COLLECTION of VE-GETABLES, consisting of 10 kinds.

- 1st, Lord Carington, High Wycombe (G. T. Miles, Gr.), £6.
 2nd, R. B. W. Baker, Esq., Romford, (W. Iggulden, Gr.), £4.

Special Prizes offered by Mr. W. Bull.

CLASS A.—12 NEW PLANTS, introduced and sent out for the first time since the commencement of 1876 by Mr. W. Bull. (Private Growers.)

- 1st, J. Warren, Esq., Handcross, Sussex (C. Rann, Gr.), a Silver Cup, value £15 15s.
 2nd, Rev. Canon Bridges, Beddington (T. N. Penfold, Gr.), a Silver Cup, value £10 10s.
 3rd, Sir Wilfred Lawson, Bart., M.P.,

. Brayton, Carlisle (J. Hammond, Gr.), a Silver Cup, value £6 6s.

CLASS B.—12 NEW PLANTS, introduced and sent out for the first time since the commencement of 1876 by Mr. W. Bull. (Nurserymen.)

- 1st, Mr. B. S. Williams, Upper Holloway, N., a Silver Cup, value £15 15s.
 2nd, Mr. J. Wills, South Kensington, S.W., a Silver Cup, value £10 10s.

Prizes offered by Messrs. Sutton and Sons.

CLASS F.—For COLLECTIONS.—Three sorts of Melons and three sorts of Cucumbers, and specimen of Melon and one brace of Cucumbers, to include Sutton's "Earl of Beaconsfield" Melon and Sutton's "Duke of Connaught" Cucumber.

- 1st, Lord O. Fitzgerald, Windsor (T. Lockie, Gr.), Gold Medal and £3 3s.
 2nd, Col. Loyd Lindsay, Wantage (J. Atkins, Gr.), Silver Medal and £2 2s.

MISCELLANEOUS EXHIBITS—Plants, Cut Flowers, Fruit, &c.,

PLANTS.

Messrs. James Veitch and Sons, Chelsea, S.W., for Groups of Roses and Maples, Gold Banksian Medal, and for Group of New and Rare Plants, Gold Banksian Medal.

Mr. B. S. Williams, Upper Holloway, N., for Group of Plants, Silver Banksian Medal.

Messrs. J. Ivery and Son, Dorking, for Collection of Azaleas, Silver Banksian Medal.

Messrs. Paul and Son, Cheshunt, N., for Collection of Roses, Silver-gilt Flora.

Messrs. G. Jackman and Son, Woking, for Groups of Specimen Clematises and Window Boxes with Clematises, Gold Banksian Medal.

Messrs. H. Lane and Son, Great Berkhamstead, for Collection of Roses, Silver-gilt Flora.

Messrs. Dick Radclyffe and Co., High Holborn, W.C., for Rockery, with Plants arranged for effect, Silver Banksian Medal.

J. G. Megaw, Esq. (J. Ford, Gr.), for 12 Calceolarias, Silver Banksian Medal.

CUT FLOWERS.

- Messrs. William Paul and Son, Waltham Cross, N., for Roses, Eight Boxes, Cut Blooms, Silver Banksian Medal.
- Mr. A. Parmley, Park Side, S.W., for Bridal and Ball Bouquets, Silver Banksian Medal.
- Mr. J. Aldous, Gloucester Road, S.W., for Dinner-table Decorations, Silver Banksian Medal.

FRUIT, &c.

- Lord Ebury, Rickmansworth (J. C. Mundell, Gr.), for 18 varieties of Apples, Bronze Knightian.
- Mrs. K. B. Cussons, Southport, for Collection of Skeletonised Leaves, Silver Flora.
- Mrs. M. Hodgkins, 35, Hyde Grove, Manchester, for Collection of Skeletonised Leaves, Silver Flora.

Horticultural Structures, Implements, Garden Appliances, &c.

- Messrs. J. H. Critchley and Co., Grosvenor Works, Cheltenham, for Patent Heat Regulators, Silver Banksian Medal.
- Messrs. John Crowley and Co., Sheffield, for Invincible Mowing Machines (Edwards's Patent), Commended.
- Messrs. Foster and Pearson, Horticultural Builders, Beeston, Notts, for Samples of Patent Slot Throttle Valve, a Silver Banksian Medal awarded, and Commended for simplicity.
- Mr. J. Matthews, Royal Pottery, Weston-super-Mare, for Terra Cotta Vases and Flower Pots, Silver Banksian Medal.
- Messrs. J. J. Thomas and Co., Edgware Road, W., for Wirework and Garden Furniture, a Silver Banksian Medal.
- Messrs. W. Richardson and Co., Darlington, for Greenhouse, Ventilators, &c., Silver Banksian Medal.
- Messrs. Doulton and Co., Lambeth, for Vases and Flower Pots, Silver Banksian Medal.
- Messrs. Joseph, Davis and Co., Newington Butts, Collection of Barometers, &c., Silver Banksian Medal.

SCIENTIFIC COMMITTEE.

Sir J. D. HOOKER, C.B., F.R.S., in the Chair.

Monstrous Primroses.—Dr. Masters commented briefly on several Primroses which had been referred to him at the previous meeting, and which admitted of being grouped under the following heads:—1. Simple calycanthemy or petaloid condition of the calyx: short-styled or thrum-eyed; a common condition and very suitable for the herbaceous border. 2. Calyx normal. Corolla partially or completely separated into its component petals; petals bright yellow on the upper surface, and with two purple spots on either side the medium line; rich chestnut-brown on the under surface, short-styled—a remarkable form, not so common as the foregoing. 3. Calyx normal. Corolla normal; lobes reddish brown on the under surface; edges involute or rolled on to the upper surface so as to show the colour; long-styled or pin-eyed. The distribution of the colour is here very remarkable. The specimens were received from Mr. Webb. 4. Fusion of three flowers. Calyx petaloid, of eighteen sepals free for about half their length, forming a

cup beneath, of a rich chestnut-brown colour edged with yellow on both surfaces. Within the calyx are three corollas, two fused together, one separate normal in form, but each six-lobed; short styled. A form of most remarkable construction, sent by Mr. Cannell, and said to be permanent under cultivation. From the fact of a truss of three flowers being enclosed within one large petaloid calyx, this variety may be recommended not only to the curious but also to the lover of ornamental plants.

Fruit Blossoms and the Frost.—Dr. Masters showed specimens of fruit blossoms from Mr. Earley. In the Cherry blossoms the petals and stamens were uninjured, but the pistil was completely blackened and killed. In the case of the Apple blossoms the petals were arrested in their growth and distorted, the stamens and pistils were uninjured. Mr. Earley, however, found the stamens to be injured in some cases, which is remarkable in so hardy a flower as the Apple.

Meal on Auricula Leaves.—Dr. M. C. Cooke remarked that the nature of the mealy substance which is found so freely on the leaves of certain kinds of Auricula having been alluded to at the previous meeting, he obtained some of these leaves through the courtesy of Mr. Dean, of Ealing, and examined them, with the view of ascertaining the nature of the meal. Under a low power of the microscope these leaves are seen to be regularly sprinkled, at equal distances, all over the surface, with uniform white clusters of a mealy looking substance, except that all around the margin of the leaf the number of these clusters is largely increased, so that in that portion they are closely crowded together. The uniformity in size of the clusters and their uniform distribution over the surface is very marked in character.

In order to ascertain the nature of this meal, he removed a portion and submitted it to examination under a quarter inch objective, with a magnifying power of about 400 diameters, and found it to consist of short broken needle shaped crystals, mixed with small granules; the addition of ordinary spirits of wine did not dissolve them, but they were soluble in benzine. He did not then endeavour to ascertain if the crystals were reformed on the evaporation of the benzine. In the next place he removed a strip of the cuticle of the leaf with the mealy clusters *in situ*, and examined this with the same quarter inch

power, by means of which he found that, although the clusters were very uniform in size and equal in distribution, they appeared to have no relationship with the stomata, were not collected at these openings, and evidently were in no sense to be attributed to exudation from the stomata. Further manipulation and dissolving away the crystals demonstrated that each of the clusters had a nucleus in the form of a globose glandular hair, with a very short stem. These glands occupied the centre of each cluster of meal, were quite empty and collapsed, with the broken crystals adhering to the surface covering them, and converting them into the appearance of clusters of meal. Thus far, then, the examination showed that the regularity of the disposition of the meal was due to the presence of globose glandular hairs, around which the meal was collected in the form of broken needle shaped crystals; and it may fairly be assumed that this meal is at first contained as a secretion within the glands, ultimately escaping and crystallizing upon the surface.

In order to ascertain the chemical characteristics of this substance, he forwarded the small quantity which remained to him, after his experiments, to one of the expert chemists in the Laboratory of the Inland Revenue, and he thus reports the result of his investigation: "The meal on the auricula leaves consists of crystals which appear to be coated with a waxy matter. On removing the meal and treating it with alcohol, strength 50 o.p., all dissolve; but on evaporating the alcohol, beautiful acicular crystals rearrange themselves in a stellate manner. I believe the meal to be an alkaloid of some kind; the crystals are very fine. It is soluble in ether, soluble also in weak hydrochloric acid on heating, but precipitated on cooling. With a better supply of leaves, and more time allowed to me for the examination, I could probably have added to this report, which may be resumed with a better supply of material."

This, therefore, was the whole of the result of his present investigation, that the mealy substance is a secretion from certain globose glandular hairs, which is transuded and crystallizes in clusters on the surface of the leaves. That it is apparently an alkaloid, the precise nature of which has not been determined on account of insufficiency of material, but what are its uses or functions in the economy of the plant no conjecture

can at present be offered. The thanks of the Committee were unanimously accorded to Dr. Cooke for his interesting remarks.

Root-Hairs.—Dr. Masters, in continuation of some previous remarks on this subject, and in allusion to the views of some French physiologists, who consider that pressure or hindrance to growth is a determining cause of the production of these hairs, exhibited a Radish which had in course of its growth penetrated and made its way through a piece of rotten wood some $\frac{3}{4}$ inch in depth. In spite of the manifest obstruction, no root-hairs were produced, or, if any, only few and very minute, as is generally the case in fleshy roots.

Curved Twigs of Cercis Siliquastrum.—Dr. Masters showed from Mr. Piffard specimens of twigs singularly bent and contorted, owing to growth having been more vigorous on one side than on the other, but to what cause the appearance was due was not apparent, no trace of insect or fungus being visible.

Plants Exhibited.—By the Hon. and Rev. J. T. Boscawen, *Listera nidus-avis*, from Cornwall; by the Rev. H. Harpur-Crewe, various specimens of *Narcissus*, from Spain, including *N. calathinus* (?); *N. Bulbocodium*, sulphur-coloured variety, found in wet places near Ovideo; *N. minimus*, from dry rocks near Panorbo. If the *Narcissus* be really found on more careful examination to be *N. calathinus*, the fact will be especially interesting, as, up to this time, it has only been recorded from an islet off the Brittany Coast. *Muscari dubia* and *armeniaca*, *Tulipa Orphanides*, and other plants, were also exhibited by Mr. Crewe. Mr. Elwes showed specimens of *Cypripedium pubescens*, to show how greatly they varied in size, and exhibited specimens of species of Tulip which under cultivation attained within a very short time four times the size of the wild forms, and varied also in colour and markings. *Tulipa Kolpakowskyana* was also shown to illustrate the great range of variation in colour of this species. *Habranthus fulgens* (?), a species with hairy leaves and umbels of white flowers, was also shown.

The Electric Light and Vegetation.—Mr. Jennings called attention to the circumstance that it was intended to illuminate the Great Show by means of the Electric Light; he thought that it would be most interesting if experiments could be made with a view to ascertain what effect would be produced upon flowers which close at night. He also alluded to the dis-

advantages under which tropical plants were grown in this country in the winter months; it was possible to furnish them with the required temperature by artificial heat, but hitherto they could not supply that other necessity, light, which they enjoyed in their native forests, and which was so essential for ripening the wood. He suggested that valuable results might be obtained from a series of experiments with the Electric Light.

FLORAL COMMITTEE.

Medals Awarded.—Gold Medals to Messrs. J. Veitch and Sons, for a group of Maples and Roses; to Messrs. J. Veitch and Sons, for a group of New and Rare Plants; and to Messrs. G. Jackman and Son, for a group of Clematis. Silver-gilt Floras to Messrs. Paul and Son (Cheshunt), for a collection of Pot Roses, and to Messrs. Lane and Sons, for a collection of Pot Roses. Silver Floras to Mrs. K. B. Cussons, for a collection of Skeletonized Leaves, and to Mrs. M. Hodgkins, for a collection of Skeletonized Leaves. Silver Banksians to Messrs. Wm. Cutbush and Son, for a group of New Holland Plants; to Mr. H. Boller, for a collection of Agaves, Cacti, &c.; to Messrs. Osborne and Sons, for a group of Stove and Greenhouse Plants, and a collection of Herbaceous Plants in pots; to Mr. B. S. Williams, for a group of Plants; to Messrs. Dick Radclyffe and Co., for Rockery; to Messrs. J. Ivery and Son, for a group of Azaleas; to Mr. J. Aldous, for Dinner Table Decorations; to Mr. James Ford, for a group of Calceolarias; to Messrs. Wm. Paul and Son (Waltham), for cut blooms of Roses; and to Mr. A. Parmley, for Bridal and Ball Bouquets.

First Class Certificates were awarded to Gloxinia "*Duchess of Connaught*," Croton *Evansianus* and Azalea (*mollis*) "*Arthur de Warelles*," from Messrs. J. Veitch and Sons; to Azalea (*indica*) "*Madeleine*," from Mr. C. Turner; to *Polyanthus superba* (as a decorative plant) and *Primula sikkimensis*, from Mr. R. Dean; to *Fritillaria recurva* and *Cypripedium pubescens major*, from H. J. Elwes, Esq.

Second Class Certificate to Amaryllis "*Lady Louisa Egerton*," from Mr. J. Speed (gardener to the Duke of Devonshire).

Highly Commended.—*Meconopsis nepalensis*, from the Society's Gardens, Chiswick.

Votes of Thanks were passed to Mr. J. Hodges (gardener to E. Wright, Esq.), for cut flowers of Orchids, and to Mr. H. Cannel, for cut blooms of Pelargoniums.

FRUIT COMMITTEE.

A Bronze Knightian Medal was awarded to Mr. J. C. Mundell, for a collection of Apples.

A Cultural Commendation was awarded to "Read's Scarlet-flesh" Melon, from Mr. G. Goldsmith.

Votes of Thanks were passed to Mr. L. A. Kellick, for a collection of Apples, and to Mr. M. Domaille, for five baskets of Kidney Potatos.

MAY 28, 1879.

THE CONVERSAZIONE.

A Conversazione was held on the evening of the 28th May, which, in spite of the pouring rain, was attended by a very large number of Fellows and their friends. The great attraction was undoubtedly the exhibition of the show under electric light. The large tent was illuminated by the British Electric Light Company. The long tent (500 feet) was divided between the Jablockoff patent of the Société Générale d'Electricité, of Paris, and Wilde's patent of the Electric Lighting Company. The conservatory was very brilliantly lighted by three of Messrs. Siemens Brothers' powerful electric lamps, worked by the Society's steam engine, another lamp from the same firm being suspended in the entrance vestibule, worked by the same motive power. The upper east quadrant was well filled by about fifty members of the Queckett Microscopical Club, who had kindly accepted the Society's invitation to contribute their instruments and presence to the general interest of the evening. The thanks of the Council were most cordially passed to those gentlemen, and especially to Mr. Ingpen, their Honorary Secretary, for their efforts to add to the success of the occasion.

The band of the Royal Horse Guards (Blue), under the direction of Mr. Charles Godfrey, performed a selection of music during the evening.

JUNE 2, 1879.

WHIT-MONDAY POPULAR SHOW.

Utterly wretched weather completely marred the success of the Second Annual Whit-Monday Show, which was in other respects a considerable improvement upon the exhibition of a similar description last year. Such a magnificent display of floral beauty, such enormous banks of colour, such grand decorative groups, had never before been arranged for so trifling an entrance fee as twopence. Several of the principal groups from the Great Show were, by the kindness of the Exhibitors, permitted to remain for this show, amongst which were Messrs. Turner's, Veitch's, and Paul's Roses, Messrs. Jackman's Clematises, Messrs. Lane's Rhododendrons, Mr. Warren's fine foliage plants. Messrs. Williams, Laing, Cutbush and Osborne, all permitted their miscellaneous groups to form part of this popular exhibition, and not for competition. The growers for Covent Garden supplied large quantities of brilliant flowering plants, which, arranged in masses in the Great Tent, lacked but one element to have created a gorgeous effect, but unfortunately that was entirely wanting, namely, bright sunshine. The character of these market plants was exceedingly good—Pæloniums, Heaths, Fuchsias, Hydrangeas, Spiræas, Bouvardias, Musk, Heliotropes, Stocks and Mignonette, all being shown in considerable quantity, as well as of first-rate quality. The Cottage Garden Prizes were better contested than last year, the number of exhibitors from the Artisan and Working classes having considerably increased, but the exhibits were by no means up to the mark. The unfavourable season is perhaps the best reason for this, but there was clearly plenty of room for improvement, and should this show be repeated in future years, the Society will expect to see a great change for the better in the quality of home-grown vegetables and flowers.

In the course of the afternoon the prizes were gracefully presented to the winners by the Misses Churchill, daughters of Lord Alfred Churchill, who was also present on the occasion.

The number of visitors during the day was 8,071.

AWARDS OF THE JUDGES.

CLASS 1.—GROUP of DECORATIVE PLANTS, in or out of flower, effectively arranged.

- 1st, Mr. John Wills, South Kensington, Silver cup, value £10 10s.
- 2nd, Messrs. Hooper and Co., Covent Garden, £7 7s.
- 3rd, Mr. J. Aldous, South Kensington, £5 5s.

CLASS 2.—GROUP of PLANTS, in flower.

- 1st, Messrs. J. and J. Hayes, Lower Edmonton, £8.
- 2nd, Mr. J. Reeves, Acton, £6.
- 3rd, Mr. E. Sawyer, Edmonton, £4.

CLASS 3.—GROUP of FINE FOLIAGED PLANTS, including Ferns and Palms.

- 1st, Messrs. Hooper and Co., £6.
- 2nd, Mr. J. Reeves, £5.

CLASS 4.—GROUP of 100 SHOW PELARGONIUMS.

- 1st, Messrs. J. and J. Hayes, £5.
- 2nd, Mr. J. Reeves, £3.
- 3rd, Mr. W. Brown, Hendon, £2.

CLASS 5.—GROUP of 100 ZONAL PELARGONIUMS.

- 1st, Messrs. J. and J. Hayes, £4.

CLASS 6.—GROUP OF 100 FUCHSIAS.

- 1st, Messrs. J. and J. Hayes, £4.
- 2nd, Mr. W. Brown, £3.

CLASS 7.—50 POTS OF MUSK.

- 1st, Messrs. J. and J. Hayes, £2.
- 2nd, Mr. G. Tibbutt, Chelsea, £1.
- 3rd, Mr. W. Brown, 10s.

CLASS 8.—50 POTS OF MIGNONETTE.

- 1st, Mr. J. Reeves, £2.

CLASS 9.—50 POTS OF STOCKS.

- 1st, Mr. J. Reeves, £2.

CLASS 10.—2 BOUQUETS (Ball-room).

- 1st, Messrs. Ponsford and Son, Brixton, £2.

CLASS 11.—2 BOUQUETS—(Bridal.)

- 1st, Messrs. Ponsford and Son, £2.

CLASS 12.—MISCELLANEOUS.

Messrs. Dick Radclyffe and Co., Holborn, Fountain with Plants, Silver Medal.

Mr. G. Tibbutt, Lily of Valley, Bronze Medal.

Mr. J. Seabrook, Ponders End, Group new Pelargoniums, Commended.

CLASS A.—GROUP or COLLECTION of PLANTS, grown in London, within a radius of 3 miles of General Post Office.

- 1st, Mr. R. Oastler, 17, Sun Street, Finsbury Square, £1 5s. and Silver Medal.
- 2nd, Miss J. F. Jarvis, Guildhall, £1 and Bronze Medal.
- 3rd, Miss M. J. White, 25, Earl Street, Finsbury Square, 15s.

CLASS B.—SPECIMEN PLANT, grown in London, within a radius of 3 miles of General Post Office.

- 1st, Mr. R. Oastler, 15s. and Silver Medal.
- 2nd, Miss J. F. Jarvis, 10s. and Bronze Medal.

CLASS C.—GROUP or COLLECTION of PLANTS, grown within a radius of 8 miles of Charing Cross.

- 1st, Mr. E. Hammutt, 1, Blizard Cottages, Fulham Road, £1 10s. and Silver Medal.
- 2nd, Mr. J. J. Linington, 20, King Street, Chelsea, £1 and Bronze Medal.
- 3rd, J. Smart, 41, Arthur Street, Chelsea, 15s.

CLASS D.—WINDOW PLANT, grown for more than 12 months by the exhibitor, within a radius of 8 miles of Charing Cross.

- 1st, Mr. J. Sharp, 13, Marlboro' Street, Chelsea, 15s. and Silver Medal.
- 2nd, Mr. W. Morgan, 1, Omega Terrace, Blenheim Road, W., 10s. and Bronze Medal.
- 3rd, Mrs. Hunt, 19, Yeoman's Row, Brompton Road, S.W., 7s. 6d.

CLASS E.—GENERAL COLLECTION of GARDEN PRODUCE, PLANTS, FLOWERS, and VEGETABLES, grown by the exhibitor within a radius of 8 miles of Charing Cross.

- 1st, Mr. E. Cane, 3, Steven's Buildings, Ealing Dean, £2 and Silver Medal.
- 2nd, J. Smart, £1 5s. and Bronze Medal.

CLASS F.—STAND or VASE of GARDEN FLOWERS, grown by the exhibitor within a radius of 8 miles of Charing Cross.

- 1st and 2nd withheld.
- 3rd, 7s. 6d.

CLASS G.—BUNCH of WILD FLOWERS, to be competed for by Children attending the various Public and Elementary Schools within a radius of 8 miles of Charing Cross.

1st, A. Choat, 3, Herbert Cottages, Paxton Road, Chiswick, 10s. and Silver Medal.

2nd, A. Brown, Hawthorn Cottage, Hendon, 7s. 6d. and Bronze Medal.

3rd, W. Richardson, 66, Paxton Road, Chiswick, 5s.

3rd, G. Tibbutt, King's Road, Chelsea, 5s.

CLASS H.—MISCELLANEOUS.

Miss E. Tringham, 25, King Street, Chelsea, for Ferns, Bronze Medal.

Mr. J. Sharpe, Fountain, Aquarium, &c., Bronze Medal.

Mr. J. Cornish, 40, Great Tower Street, E.C., Case of Ferns, Bronze Medal.

JUNE 10, 1879.

ORDINARY GENERAL MEETING.

Sir TREVOR LAWRENCE, Bart., M.P., V.P., in the Chair.

Elections.—Mrs. Elizabeth Allix, The Right Honourable Lord Annaly, Mrs. Maria Baker, Mrs. Edith Bamber, Frederic Brindley, M.A., Mrs. Fitzroy Campbell, Colonel Crossman, R.E., Thomas T. Hodgson, S. King Church, John E. Lane, Mrs. C. A. Las Casas, John Patterson, Mrs. Arthur Peto, Edward R. Wingfield.

Medal Awarded.—To Messrs. Veitch and Sons, a Silver Flora for a group of Orchids and other plants.

SCIENTIFIC COMMITTEE.

Sir J. D. HOOKER, C.B., F.R.S., in the Chair.

Fungoid Growth upon Lilies.—Specimens of an *Æcidium* attacking Lilies in the garden of Mr. Elwes, which was referred to Mr. Berkeley, were shown; also \times *Gesnera Chelsoni*, a hybrid between *Gesnera macrantha* and *Dolichodeira tubiflora* and *Choretis glauca*.

Pollinia of Orchis latifolia.—Rev. George Henslow exhibited flowers of *Orchis latifolia* sub sp. *incarnata*, and stated that the pollinia when removed on a pencil-point do not become depressed slowly, as is the case with *O. maculata*, &c., but drop down suddenly, the caudicle being too slender to support the weight of the pollen-mass. The highly elastic caudicle is flattened transversely to the line of falling, and slightly concave just above the viscid disk, which is firmly fixed by the gummy cement with great rapidity.

Change of Sex in Plants.—Rev. G. Henslow exhibited drawings of—(1) Abnormal flowers of *Ranunculus auricomus*, in which the tendency to produce male structures had affected the carpels on the one hand and the petals on the other. Some of the carpels were open with extruded ovules, but others bore two anther-cells but no ovules. The petals presented various degrees of “staminody,” bearing imperfect anther-cells on their margins. Some petals were sepaloid in being green with a yellow border, while on the other hand the sepals were partially petaloid. (2) Pistils of *Salix*, mostly open and with one or two anther-cells in place of ovules, which latter were rarely present and then only single, and in an abortive state. (3) Parts of flowers of a double but polypetalous polyanthus. One pistil was open, partially petaloid and antheriferous at the same time. Another exhibited a prolongation at the base which bore ovules, and seemed to confirm Van Tighem’s view that the free-central placenta of *Primula* is constructed out of “heel-like” projections from the carpels, and is therefore probably carpellary.

Arrest of Growth in the Wing of a Moth.—Mr. Webb showed a moth hatched by him in which one of the wings remained limp after death, owing to the disunion of the upper and lower surfaces of the wing, and the intervention of a thin layer of fluid which shifted in position as the wing was moved, producing, in fact, a dropsical condition of the wing.

FLORAL COMMITTEE.

First-class Certificates were awarded to Pelargoniums (decorative) “*Maid of Kent*” and “*Nellie Hayes*,” from Messrs. J. and J. Hayes; to Gloxinia “*Yakoob Khan*”; *Cattleya Mac Morelandii*, and Begonia “*Mrs. Arthur Potts*,” from Messrs. J. Veitch and Sons; to *Imantophyllum concinnum*, and *Ochna multiflora* (as a decorative plant), from Mr. B. S. Williams; to Begonias “*J. H. Laing*,” “*Marie Bouchet*,” and “*Cloris*,” from Messrs. J. Laing and Co.; to *Saxifraga Wallacei*, from Messrs. Dicksons and Co., and to Begonia “*Souvenir de Gand*,” from Messrs. Osborn and Sons.

Cultural Commendations to *Dendrobium Falconeri*, from Mr. W. Fisher (gardener to F. Williams, Esq.), and to Seedling Pansies, from Mr. L. J. Fleming. Votes of Thanks to Mr. J. Burnett (gardener to Mrs. Hope), for *Choretis glauca*; to Mr. W. Fisher

(gardener to F. Williams, Esq.), for *Saccolabium retusum*; to Mr. C. Turner, for Pelargonium "*Illuminator*," and to Royal Horticultural Society, for a group of Pelargoniums from the Society's gardens, Chiswick.

FRUIT COMMITTEE.

A First-class Certificate was awarded to Melon (green fleshed), "*William Tillery*," from Mr. J. Miller (gardener to the Duke of Newcastle).

JUNE 24, 1879.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice-President, in the Chair.

Elections.—H. A. W. Bisshop, Henry Cockburn, Mrs. Clayton East, Clement Hoey, William Bulkeley Hughes, M.P., David B. Lees, M.D., Arthur Parmley, Sarah De Coursey Parish, Lady Caroline Turnor.

Medals Awarded.—Gold Medal to Mr. C. Turner, for a group of Pelargoniums, and to Mr. W. Fisher (gardener to F. Williams, Esq.), for a group of Gloxinias.

SCIENTIFIC COMMITTEE.

ARTHUR GROTE, Esq., F.L.S., in the Chair.

Fungoid growth upon Lilies.—The Rev. M. J. Berkeley reported on the fungoid growth submitted to him from Mr. Elwes' garden, as follows:—

"The parasite on *Lilium columbianum* appears to be *Uredo Prostii*, Duby, which scarcely differs from *Uredo Asphodeli*, D.C., of which Duby, as far as I find, takes no notice. It does not agree with *Uredo Alliorum*, D.C.; *Uredo Lilii* differs altogether in its dark colored spores. *Uredo Asphodeli*, D.C., is given by Link as a synonym of *Uredo Ornithogali*, but it agrees neither with the characters, nor the specimen of Schmidt and Kunze. Duby's description exactly accords with young specimens, and the spores are globose, oblong, and pyriform as he describes them. The only question is whether it may not be an exaggerated form of *U. Alliorum*, a matter of some importance, as that is extremely common, while the plant of Decandolle and Duby

is very rare. In the latter case, it may be stamped out by burning every affected stem ; in the former this will not avail, as almost every onion bed might propagate the evil. It would be better on the whole to assume that *U. Prostii* is rare, and so strive to get rid of what may prove a serious pest. This is certainly a *Uredo*, and not a *Trichobasis*. There is no pedicel, and I have seen the spores inclosed in the parent cell."

History of the Genus Tulipa.—Mr. Elwes communicated an elaborate paper on this subject, which is printed in full in the Society's *Journal*.

Diffusion of Coloured Liquids in Flowers.—A pamphlet on this subject, by Dr. Saccardo, was laid on the table.

Cucumber Disease.—Messrs. Smith, of Dulwich, sent clubbed roots of Cucumber, the swelling being apparently due to the presence of vibrios.

Lilies Injured by Insects.—Mr. Jennings showed bulbs of *Lilium testaceum*, damaged by insects, which were referred to Mr. McLachlan for report.

Monstrous Pyrethrum and Primrose.—Dr. Masters showed, from Mr. Parker, a flower-head of a *Pyrethrum*, the florets on one half of which were long and strap-shaped, while on the other half they were tubular, as in the *Anemone*-flowered race. Dr. Masters also showed, from Mr. Douglas, a remarkable form of the common *Primrose*, which will be examined and reported on at a future time.

Plants Exhibited.—By the Rev. Harpur-Crewe, *Vicia armena*, a charming hardy Vetch with large lilac flowers. By G. F. Wilson, Esq., a cut spike of *Xerophyllum asphodeloides*. By Dr. Masters : a spray of cut leaved Hornbeam, from Mr. Morrell, Oxford; and a bloom of *Cereus*, referred to Mr. Croucher. From Messrs. Veitch : *Cyrtopodium* sp., curious for the circumstance that each flower was subtended by a bract marked with bars and spots like the sepals ; also a hybrid *Dendrobium* between *D. Huttoni* and *D. sanguinolentum* ; and *Ledebouria pendula*, a *Eucomis*-like plant, with greenish flowers.

FLORAL COMMITTEE.

First-class Certificates were awarded to *Coleus* "*Eva*," from Mr. J. King (gardener to G. Simpson, Esq.) ; to *Begonia* "*Royal Standard*," from Mr. J. Chambers ; to *Davallia fijiensis major*,

from Messrs. J. Veitch and Son; and to *Xerophyllum asphodeloides*, from G. F. Wilson, Esq., F.R.S.

Cultural Commendation to *Cypripedium barbatum superbum*, from Mr. A. Boxall.

A Vote of Thanks was passed to Messrs. Barr and Sugden for cut blooms of Pyrethrums and Irises.

FRUIT COMMITTEE.

Cultural Commendations were awarded to Strawberry "*Duc de Magenta*," from Mr. J. Douglas (gardener to F. Whitbourn, Esq.), and to two dishes of Tomatos, from Mr. R. Gilbert (gardener to the Marquis of Exeter).

JULY 8, 1879.

ORDINARY GENERAL MEETING.

Major F. MASON in the Chair.

Elections.—Mrs. Delvin Fremantle, H. M. Grimsdale, Thos. Wilde Powell, Miss Wade.

Medals Awarded.—Gold Medals to Mr. B. S. Williams, for a group of Plants; to Mr. J. Wills, for a group of Plants; to Messrs. John Laing and Co., for a group of Plants; and to Mrs. M. Hodgkins, for a collection of Skeletonized Leaves. A Silver-gilt Knightian to Messrs. T. Rivers and Son, for a collection of fruit trees in pots. A Silver Flora to Messrs. Barr and Sugden, for cut Pyrethrums, Ixias, &c. Silver Banksians to Messrs. W. Cutbush and Son, for a group of Plants; to Mr. R. Parker, for miscellaneous Plants and Cut Flowers; to Messrs. Osborn and Sons, for a group of Plants; to Messrs. Hooper and Co., for a collection of Succulents; to Messrs. Hawkins and Bennett, for a group of Pelargoniums and Maiden Hair Ferns; to Messrs. F. and A. Smith, for a group of Plants; and to Mr. H. Hooper, for Cut Flowers of Pyrethrums, Pansies, &c. Bronze Banksians to Mr. H. Boller, for a collection of Cacti, and to Mr. J. Marcham, for Single Petunias.

Upon this occasion was held the Society's Show of Cut Roses, which, considering the weather and the lateness of the season, was fairly successful. The Annual Exhibition of the Pelargonium Society was also held in conjunction with the present Meeting.

AWARDS OF THE JUDGES.

CLASS 1.—48 Distinct Single Trusses. (Nurserymen.)

- 1st, Messrs. Curtis, Sanford and Co.,
The Nurseries, Torquay, £5.
2nd, Messrs. Paul and Son, Old
Nurseries, Cheshunt, £3.
3rd, Messrs. J. Keynes and Co., The
Nurseries, Salisbury, £2.
Commended, Mr. B. R. Cant, The
Nurseries, Colchester.

CLASS 2.—24 Distinct, Three Trusses of each. (Nurserymen.)

- 1st, Messrs. Curtis, Sanford and Co., £5.
2nd, Messrs. Paul and Son, £3.
3rd, Messrs. J. Keynes and Co., £2.

CLASS 3.—24 Distinct Single Trusses. (Nurserymen.)

- 1st, Messrs. J. Laing and Co., The
Nurseries, Forest Hill, £3.
2nd, Messrs. Curtis, Sanford and Co., £2.
3rd, Messrs. J. Keynes and Co., £1.

CLASS 4.—12 Distinct Single Trusses. (Nurserymen.)

- 1st, Messrs. Curtis, Sanford and Co.,
£1. 10s.
2nd, Messrs. J. Keynes and Co., £1.
3rd, Messrs. J. Laing and Co., 15s.

CLASS 5.—24 Distinct Single Trusses, (Amateurs.)

- 1st, R. N. G. Baker, Esq., Heavitree,
Exeter, £4.
2nd, J. Hollingworth, Esq., Turkey
Court, Maidstone, £3.
3rd, Mr. J. Davis, The Square, Wilton,
Wilts, £2.

CLASS 6.—12 Distinct, Three Trusses of each. (Amateurs.)

- 1st, R. N. G. Baker Esq., £4.
2nd, J. Hollingworth, Esq., £3.
3rd, Mr. J. Davis, £2.

CLASS 7.—12 Distinct Single Trusses. (Amateurs.)

- 1st, G. P. Hawtrey, Esq., Langley
Place, Slough, £2.
2nd, R. N. G. Baker, Esq., £1.
3rd, Mr. J. Davis, 15s.

CLASS 8.—12 Distinct TEA or NOISETTE. (Open.)

- 1st, G. P. Hawtrey, Esq., £1.
2nd, J. H. Pemberton, Esq., Romford,
15s.
3rd, Messrs. J. Keynes and Co., 10s.

CLASS 9.—6 of any one sort of HYBRID PERPETUAL. (Open.)

- 1st, R. N. G. Baker, Esq., 15s.
2nd, Mr. B. R. Cant, 10s.
3rd, W. Farren, Esq., Cambridge, 5s.

CLASS 10.—6 of any one sort of TEA or NOISETTE. (Open.)

- 1st, G. P. Hawtrey, Esq., 15s.
2nd, Mr. J. Davis, 10s.
3rd, W. Farren, Esq., 5s.

CLASS 11.—6 Distinct NEW ROSES of 1877 and 1878. (Open.)

- 1st, Messrs. Curtis, Sanford and Co., 15s.
2nd, Messrs. Paul and Son, 10s.
3rd, Messrs. J. Keynes and Co., 5s.

Special Prizes offered by Messrs. John Laing and Co.

CLASS A.—9 TUBEROUS BEGONIAS, Distinct. (Amateurs.)

- 1st, Mr. J. Tong, Gr. to J. S. Law, Esq., Southgate, £3.
2nd, Mr. A. Luff, Gr. to R. R. Hyatt, Esq., Streatham, £2.

Classes B. and C., offered by Messrs. James Carter and Co.

CLASS B.—COLLECTION OF VEGETABLES. (Amateurs.)

- 1st, Mr. G. T. Miles, Gr. to Lord Carington, High Wycombe, £7.
2nd, Mr. W. Iggulden, Gr. to R. B. W. Baker, Esq., Romford, £5.
3rd, Mr. R. Phillips, Gr. to Capt. Jackson, Gravesend, £3.
4th, Mr. S. Haines, Gr. to the Earl of Radnor, Highworth, £1. 10s.

CLASS C.—4 DISHES OF PEAS.

- 1st, Mr. J. Richardson, Boston, Lincolnshire, £3. 3s.

Offered by Messrs. Hooper and Co.

CLASS D.—COLLECTION OF VEGETABLES.

- 1st, Mr. W. Iggulden, £5. 5s.

Offered by Messrs. Sutton and Sons.

CLASS E.—6 DISHES OF PEAS.

- 1st, Mr. W. Iggulden, Silver Medal and £2 2s.

MISCELLANEOUS.

HIGHLY COMMENDED.

Mrs. Bishopp, Esher, for Wax Flowers.

COMMENDED.

Messrs. Smith and Larke, Kensington, for Bouquets and Flowers for Table Decoration.

Messrs. Dick Radclyffe and Co., High Holborn, for Fountain.

SCIENTIFIC COMMITTEE.

Dr. MAXWELL T. MASTERS, F.R.S., in the Chair.

Monstrous Primrose.—Dr. Masters reported on the specimen exhibited by Mr. Douglas at the last meeting. The main flower-stalk, instead of bearing a single flower, bore a tuft of leaves, intermixed with which were a number of extremely deformed flowers, presenting many and complex changes, the most important of which consisted in the presence of anthers as well as of ovules on the margins of the same carpellary leaf.

Insects Injurious to Cinchona in Ceylon.—The Rev. M. J. Berkeley sent a pupa of a large moth, possibly one of the *Sphingidæ*, the larva of which feeds on the leaves of *Cinchona succirubra* in Ceylon. The specimen was not sufficient for identification.

Lathyrus Drummondii.—The Rev. H. Harpur-Crewe submitted flowers of this, to show that there was no difference between the plant so named in gardens and *L. rotundifolius*.

Grapes from the Old Wood.—The Rev. G. Henslow showed a specimen of a bunch of Grapes produced from the old wood—a state of things occasionally but rarely met with.

Erineum.—Dr. Masters showed from Mr. Earley, leaves of a Vine with thickened epidermis and dense hairs, arising, not from a fungus, but from an over development of the skin of the leaf.

Plants Shown.—From Mr. McIntosh: Fusion of two flowers of *Lilium longiflorum*. From Mr. Laing: Double Begonia, with a very long stout flower-stalk, the leaf-shoots adjacent being proportionately diminished in size. From Colonel Clarke: *Watsonia spicata* (*Micranthus fistulosus*, Klatt), *W. plantaginea* (*M. plantagineus*, Ejusdem), and *Ismene pedunculata*, Herbert. From Messrs. Dickson and Turnbull, Perth, splendid spikes of *Orchis maculata* var. *superba*. From Mr. W. Heale, a new scented-leaved Pelargonium, and a bunch of “*Little Gem*” *Viola*, a very pretty flower with the colour of a Primrose.

FLORAL COMMITTEE.

First-class Certificates were awarded to Begonia "*Reine Blanche*," from Messrs. J. Laing and Co.; to Begonia "*Constance Veitch*," and Rhododendron "*Duchess of Teck*," from Messrs. J. Veitch and Sons; to Coleus "*Maude*," from Mr. J. King (gardener to G. Simpson, Esq.); to Pelargonium (tricolor) "*Mr. Henry Cox*," from Mr. C. Edmonds; to Pelargonium (decorative) "*Princess of Wales*," from Messrs. J. and J. Hayes; to Rose (H. P.), "*Duke of Teck*," from Messrs. Paul and Son; to Begonia "*Edward Morren*," from Mr. H. Cannell; and to Pelargonium (decorative) "*Volonté Nationale*," from Mr. F. Perkins.

Cultural Commendation to a group of Orchids, from Mr. W. Reeves (gardener to C. Hart, Esq.)

A vote of thanks was passed to Mr. H. Heims (gardener to F. A. Philbrick, Esq., Q.C.), for *Dendrobium filiforme*.

FRUIT COMMITTEE.

A Silver-gilt Knightian Medal was awarded to Messrs. T. Rivers and Son, for a collection of Fruit Trees in pots.

Cultural Commendations were awarded to thirteen fruits of Melon "*Earl of Beaconsfield*," from Mr. H. Wildsmith (gardener to Viscount Eversley); and to Pineapple "*Providence*," from Mr. Perkins (gardener to C. Kieser, Esq.)

Votes of Thanks were passed to Mr. R. Gilbert (gardener to the Marquis of Exeter), for Melons; to Mr. Jarvis (gardener to G. Edwards, Esq.), for a dish of Peaches; to Mr. Coomber (gardener to Colonel Wilkinson), for Twin Cucumber; and to Mr. Spavin, for Peaches and Nectarines.

JULY 9, 1879.

THE EVENING FÊTE.

The Evening Fête of the Society, held on the 9th July, was attended by a large number of Fellows and their friends. The gardens were brilliantly illuminated. Four of Messrs. Siemens Brothers powerful electric lights rendered all the upper terraces as bright as in tropical moonlight, and in the lower garden the walks were festooned with small lamps.

In the arcades were exhibited many novel scientific inventions and objects of interest, amongst which should be recorded the following :—Edison's loud-speaking Telephone, lent by the Right Hon. E. P. Bouverie and Colonel Gourand, exhibited by Mr. Arnold White ; the Phonograph, or talking and singing machine, lent by the London Stereoscopic Company ; Edison's Electric Pen, exhibited by Mr. Thomas Butler ; Telegraphic apparatus, various, lent by the Post-Master General ; Praxinoscope and diagrams, Microscopes, Singing Water Hammer, Graphoscopes and Stereoscopes, exhibited by Messrs. Murray and Heath ; Models of tropical fruits, specimens of Indian vegetable productions, and diagrams of Indian plants and trees, lent by the Director of the Indian Museum ; Revolving stereoscope and " Grip," Charles Dickens' favourite raven, alluded to in " Barnaby Rudge," lent by the London Stereoscopic Company ; Microscopes, with objects, lent by Messrs. Ross and Co. ; Three-shutter telephone line indicator complete, six-shutter electric bell and telephone indicator combined, for domestic purposes, and automatic switch call bell for single line, with telephones, exhibited by the Telephone Company ; Steam engines by P. Brotherhood, working two of Siemens Brothers' electric lights, lent by the inventor. Large Automatic Spectroscope, with a dispersive power of twenty-four dense flint glass prisms, showing the spectra of silver and gold ; new forms of Stephenson's binocular microscopes, displaying a new set of crystals derived from coal tar, prepared by A. C. Cole, Esq. ; and Micro-Spectroscope, with the absorption spectra of colouring matters from leaves and juices of plants, lent by Mr. John Browning. Phonoscope, an apparatus for rendering visible by electricity musical sounds, apparatus for showing the effects of the human voice on a gas jet, apparatus for showing the nodal points of a vibrating cord, Ladd's dynamo-magneto machine, Gramme-machine for laboratory use, microscopes and polariscopes, lent by Messrs. W. Ladd and Co. Collection of economic and medicinal plants, comprising specimens of the trees and plants which produce the spices and condiments in daily use, tropical fruits, valuable woods, gums, medicines and poisons ; collection of interesting carnivorous plants ; and collection of plants which may not inappropriately be called " botanical jewelry," lent by Mr. William Bull. Collection of Japanese books and other Japanese

articles, cones from California, musical instruments from Borneo and Madagascar, cloth fibre of the Kopeh, cups and bowls taken from the graves of Indians in Peru, ornaments from the South Sea Islands, and nickel silver ore, lent by Messrs. J. Veitch and Sons. Lighting in the conservatory and upper gardens by Messrs. Siemens Brothers; in the rose garden and the great exhibition tent by the Anglo-American Electric Light Company with the Wallace light; the "Eclipse" gas engine, exhibited by Messrs. Louis Simon and Son, Nottingham, working Electric Light in the vestibule.

The bands of the 1st Life Guards and the Royal Horse Guards (Blue) performed selections of music in the gardens, and part songs were given by the members of the Lombard Amateur Musical Society under the direction of Mr. Prendergast.

JULY 22, 1879.

ORDINARY GENERAL MEETING.

LORD ALFRED S. CHURCHILL, Vice-President, in the Chair.

Elections.—Selim Bustros, George Procter Hawtrey, Herman James Sillem.

Medals Awarded.—Silver Banksian to Messrs. James Veitch and Sons, for a collection of cut blooms of Roses.

The Assistant Secretary made a few remarks upon some of the interesting plants in the room, and Mr. Elwes commented upon the new varieties of *Iris Kämpferi*.

SCIENTIFIC COMMITTEE.

DR. MAXWELL T. MASTERS, F.R.S., in the Chair.

The chief business of the Meeting on this occasion consisted in the exhibition of various specimens of rare or interesting plants.

Plants, &c., Exhibited.—Mr. Elwes showed specimens of the following :—*Polygonatum giganteum*, a very tall-growing Solomon's Seal, with greenish, elongated, bell-shaped flowers; *Bomarea Salsilla* (*acutifolia* of gardens), a very pretty Alströmeria-like plant, with clusters of pink bell-shaped flowers. It is an old inhabitant of our greenhouses, but it is not generally known that it is

hardy out-of-doors. *Milla longipes*, with umbellate, erect, funnel-shaped, brownish flowers; *M. Murrayana*, with umbels of blue flowers; *M. laxa*, with flowers of similar character, but larger and paler; *Calliprora lutea*, a yellow-flowered Milla-like plant; *Brodiaea congesta*, *Allium Palmeri*, *Tricoccum Murryanum*, *Scilla peruviana*, various species of *Gladiolus*, with rich scarlet or crimson flowers, with a large white spot in the centre of the three upper petals.

Polyandrous Horse Radish.—The Rev. George Henslow showed flowers of Horse Radish, with an unusual number of stamens, on which he promised a further report.

Echeveria carunculata.—From Mr. Bull came a plant of this singular form, wherein the leaf is hypertrophied, and produces a warted, lobed fleshy mass on its upper surface, similar to what may occasionally be seen in the Cabbage. The same exhibitor also sent a specimen of *Acacia sphaerocephala*, showing the stout thorns which serve as a nest for ants, and the curious glandular processes on the leaves which furnish food for the said ants, who repay the shelter and food provided for them by driving off the leaf-eating ants and other noxious intruders.

Dendrobium formosum giganteum.—Mr Jennings called attention to the peculiar mode of flowering of a specimen of this plant. Usually the flowers appear at the extremity of the elongated pseudobulbs at the end of the growing season, but in this case the flowers appeared to come from the base of the pseudobulbs, or rather, in reality, from very shortened arrested bulbs.

Japanese Plants, &c.—Dr. Masters gave an account of a visit he had lately paid to Messrs Veitch's nursery at Combe Wood, and showed specimens of various hardy Japanese, Chilian and New Zealand plants, which he had gathered there, among which may be mentioned the very elegant quite hardy evergreen *Quercus cuspidata* and its variegated varieties, *Daphne Genkwa*, *Rhus semi-alata*, *Sterculia platanifolia*, various forms of *Vitis heterophylla*, *Elæagnus macrophylla*, a splendid evergreen *Elæagnus*, with broad ovate acute leaves, shining on the upper, silvery on the lower surface; *Pratia angulata*, a pretty little creeping plant from New Zealand, with the foliage of *Wahlenbergia hederacea*, and white flowers like those of a *Lobelia*—admirably adapted for rockeries; *Styrax obassia*, a noble Japanese shrub, with large

downy palmate leaves and racemes of drooping fragrant white flowers ; *Corylopsis pauciflora* fol. var., an elegant semi-scandent shrub, with leaves like those of a Lime, but beautifully variegated with pink and cream colour ; *Acer nikoense*, a Maple new to gardens, with ternately compound leaves and red hairy stems ; *Veronica Traversii*, a New Zealand species, which proves quite hardy at Combe Wood, and which bears London smoke better than most plants ; *Boldoa fragrans*, a Chilian plant, with aromatic leaves, generally grown as a greenhouse plant, but which is quite hardy at Combe Wood ; *Dracocephalum Ruyschiana* var. *japonicum*, the Japanese form of a common European plant, very beautiful as a hardy herbaceous perennial ; *Eucryphia pinnatifolia*, a remarkable Chilian shrub, with pinnate leaves and large white flowers ; *Conandron ramondiioides*, a very remarkable plant, allied to *Ramondia pyrenaica*, intermediate in some respects between *Gesneraceæ*, *Solanaceæ*, and *Scrophulariaceæ*, with a single leaf and a scape of white flowers, marked with yellow spots and with the anthers combined into a tube ; *Actinidia kolomickta*, a semi-scandent shrub, with ovate, acuminate, serrate leaves and white flowers, like those of a *Philadelphus* ; *Abies bifida*, the plant generally grown as *A. firma* ; *Grevillea rosmarinifolia* and *G. sulphurea*, both hardy in this locality ; *Escallonia Philippiana*, a very pretty evergreen species, with a profusion of small white starry blossoms ; *Nandina domestica*, *Xanthoceras sorbifolia*, *Staphylea colchica*, *Hymenanthera crassifolia*, *Azara microphylla*, *Maackia amurensis*, with foliage like that of a *Wistaria* ; *Drimys Winteri*, *Abies canadensis* var. *parvifolia*, a curious variety of the Hemlock Spruce, with short leaves and long spreading branches ; a dwarf variety of *Retinospora filifera*, *Acacia Nemu*, *Viburnum Sieboldi*, &c. All the plants above mentioned have proved hardy at Combe Wood.

Gall on Rhododendrons.—Specimens of small apple-like galls on the leaves and shoots of \times *Rhododendron Wilsoni* were shown by Dr. Masters, and referred to Dr. Cooke, who reports that the fungus which causes the gall is *Exobasidium Rhododendri*.

Double Begonia.—Dr. Masters showed flowers of a double *Begonia* \times *B. Veitchii*, in which the petals assumed more or less of the aspect of open carpels, bearing ovules on their margins, and terminating above in coiled stigmas.—This was the last meeting of the present session.

FLORAL COMMITTEE.

First-class Certificates were awarded to *Tradescantia multicolor*, *Sarracenia atrosanguinea*, and *Coleus* “*James Barnshaw*,” from Mr. W. Bull; to *Coleus* “*Dr. Brushfield*,” from Mr. R. Lloyd; to *Pescatorea Klabochiana*, from Mr. J. C. Spyers (gardener to Sir Trevor Lawrence, Bart., M.P.); to *Bromelia Binotii*, from Mr. B. S. Williams; and to *Iris Kämpferi*, var., from H. J. Elwes, Esq. —

Second-class Certificates were awarded to Rose (H. P.), “*Isabella Ward*,” from Mr. R. Ward; and to Tree Carnation “*The Queen*,” from Mr. C. Turner.

A Cultural Commendation was awarded to Mr. J. C. Spyers, for *Odontoglossum coronarium*.

Votes of Thanks were passed to Mr. H. Cannell for cut blooms of Begonias, Sweet Williams, &c.; to Messrs. Barr and Sugden, for cut blooms of Irises; and to Mr. H. Hooper for cut flowers of Carnations, Picotees, and Pinks.

FRUIT COMMITTEE.

Cultural Commendations were awarded to Fruit of the Vanilla, from Mr. S. A. Woods (gardener to G. S. Foljambe, Esq.; and to Nectarine “*Albert Victor*” (twelve fruits), from Mr. J. Atkins (gardener to Colonel Loyd Lindsay).

AUGUST 12, 1879.

FLORAL COMMITTEE.

Medals Awarded.—Silver Floras to Messrs. W. Paul and Son, for Cut Roses; and to Messrs. J. Laing and Co., for groups of Begonias and Phloxes. Silver Banksians to Messrs. Paul and Son and to Mr. C. Turner, for Cut Roses. Bronze Banksians to Messrs. C. Lee and Son, for a group of Begonias, and to Mr. H. Boller, for a group of Cacti.

First-class Certificates were awarded to Begonia “*Stanstead Rival*,” from Messrs. J. Laing and Co.; to *Coleus* “*Tricolor*,” from Mr. H. Cannell; to *Sarracenia formosa*, *Nepenthes Vieillardii*, *Iris Kämpferi*, vars. “*Sir S. Northcote*,” “*The Jersey Belle*,” and “*Charles Maries*,” from Messrs. J. Veitch and Sons; to *Gladiolus hybridus Lemoineus*, from Mons. V. Lemoine; to Fuchsia “*Eclipse*,” from Mr. G. Smith.

Botanical Commendation to *Conandron ramondiioides*, from Messrs. J. Veitch and Sons.

Votes of Thanks were passed to Messrs. Osborn and Sons, for a group of Plants; to Messrs. F. and A. Smith, for a group of Balsams; to Messrs. J. Veitch and Sons, for a group of Orchids; to Mr. H. Cannell, for cut blooms of Pelargoniums, Verbenas, &c.; to Mr. J. Tong (gardener to J. S. Law, Esq.), for Begonias; to G. F. Wilson, Esq., F.R.S., for *Eryngium giganteum*; and to Mr. J. Wills, for *Hydrangea paniculata grandiflora*.

FRUIT COMMITTEE.

A First-class Certificate was awarded to Melon "*Victory of Bristol*," from Mr. W. Carmichael (gardener to H. P. Oakes, Esq.)

AUGUST 26, 1879.

FLORAL COMMITTEE.

Medals Awarded.—Gold Medals to Messrs. J. Kelway and Son, for a collection of Gladioli (cut spikes); and to Mr. H. Cannell, for cut blooms of Verbenas, Phloxes, and Hollyhocks. Silver Banksian to Messrs. T. Perkins and Sons, for cut blooms of Roses.

First class Certificates were awarded to *Encephalartos Fredericii Guilielmi*, *Agapanthus umbellatus albus*, *Kentia Wendlandii*, and *Carludovica Drudei*, from Mr. W. Bull; to Gladioli "*Duchess of Connaught*," "*Duke of Connaught*," "*S. Jennings*," "*Electra*," and "*T. S. Ware*," from Messrs. Kelway and Son; to Picotees "*Princess Beatrice*," "*Lady Roseberry*," and "*Sultana*," from Mr. C. Turner.

Highly Commended: Strain of Picotees from Mr. C. Turner.

Votes of Thanks were passed to Mr. R. Lloyd, for Seedling Coleuses; to Messrs. F. and A. Smith, for a collection of Balsams; and to Mr. W. Bull, for pan of *Tigridia grandiflora*.

FRUIT COMMITTEE.

A First-class Certificate was awarded to Bean "*New Mammoth Negro*," from Messrs. Hurst and Son.

Cultural Commendation, to Apples "*Strawberry Pippin*" and "*Kerry Pippin*," from Mr. J. Douglas (gardener to F. Whitbourn, Esq.)

Commended (for its fine appearance as an exhibition pea), Autumn Marrow Pea, from Mr. W. Culverwell.

LIST OF FELLOWS, &c., TO WHOM PLANTS AND SEEDS HAVE BEEN SUPPLIED FROM THE SOCIETY'S GARDENS, CHISWICK, NOT INCLUDING THOSE SUPPLIED FROM KENSINGTON.

- Adams, Mrs. G. W. Plants, 21.
 Aiton, Mrs. Plants, 28 ; Seeds, 2 packets of 25 each.
 Aldridge, Mrs. John. Plants, 15.
 Allbutt, Thos. Clifford. Plants, 15.
 Alston, Mrs. Crewe. Plants, 15 ; Strawberries, 3 varieties of 50 each ; Raspberries, 25 of 1 variety.
 Allen, Charles John. Plants, 15.
 Ames, Edward. Plants, 20.
 Ashmore, Mrs. Plants, 15.
 Atkins, T. H. Plants, 16.
 Aylesford, Dowager Countess of. Seeds, 1 packet of 25.
 Baillie, Lieut.-Col., Duncan. Plants, 18.
 Ballard, Mrs. Plants, 15.
 Barretto, Baron. Plants, 15.
 Barron, William & Sons. Apples, 3 varieties (grafts) ; Pears, 7 ditto ; Plums, 4 ditto.
 Bartleet, H. S. Seeds, 4 packets ; Plants, 13.
 Bartlett, John Edward. Plants, 12 ; Gloxinias, 6 varieties (leaves).
 Batten, Mrs. Chisholm. Plants, 14.
 Bayley, Robert. Plants 15 ; Pelargonium (zonal), 8 varieties (cuttings) ; ditto (fancy), 6 varieties (cuttings) ; Apples, 2 varieties (grafts).
 Beale, Lionel. Plants, 14.
 Buckingham Hort. Society. Seeds, 15 packets of 25 each.
 Beale, E. J. Vines, 8 varieties (cuttings) ; Apples, 15 varieties (cuttings) ; Pears, 2 varieties (cuttings) ; Cherries, 4 varieties ; (cuttings) ; Figs, 5 varieties (cuttings).
 Beauchamp, Lady. Plants, 20.
 Benham, Mrs. Seeds, 2 packets of 20 each.
 Berners, Mrs. Hugh. Plants, 15.
 Best, Major Mawdestley. Plants, 15.
 Bird, Augustus. Plants 12 ; Phloxes, 12 varieties. Seeds, 2 packets of 25 each.
 Bird, P. Hinckes. Plants, 22.
 Bishop, Major-General W. D. Plants, 27.
 Blaauw, Thomas St. Leger. Plants, 14.

Blenkins, George E. Plants, 15; Pelargoniums (zonal), 5 varieties (cuttings).
 Blenkinsop, B. Plants, 19; Raspberries, 100; Rhubarb, 6 crowns.
 Bragg, T. Plants, 9.
 Brooker, Mrs. Plants, 15.
 Buckley, Mrs. Plants, 26.
 Burkinyoung, Mrs. J. A. Plants, 17.
 Burnaby, Mrs. H. F. Plants, 27.
 Burton, Decimus. Plants, 15.
 Bury, Rt. Hon. Viscount. Plants, 24.
 Butler, Mrs. C. Plants, 16.
 Crewe, Rev. H. Harpur. Plants, 20.
 Calthorpe, Lord. Plants, 16; Eucalyptus, 4 varieties (8 plants), Seeds, 3 varieties; Pelargoniums (Cape), 7 varieties.
 Cannell, Henry. Plants, 4.
 Cave, Mrs. S. Plants, 25.
 Cawley, James. Plants, 20.
 Chambers, Montagu. Plants, 14; Seeds, 2 packets of 25 each.
 Chaplin, Mrs. Plants, 15.
 Chapman, D. B. Plants, 12.
 Childers, John Walbanke. Plants 26.
 Churchill, Lord A. S. Plants, 2 (*Cryptomeria elegans*).
 Clarke, Col. R. T. Currants, 6 varieties (cuttings); Gooseberries, 11 varieties (cuttings); Pelargoniums, 9 varieties; Canna, 1 variety.
 Climensson, Rev. John. Plants, 23.
 Clowes, George. Plants, 15.
 Cobbold, Henry C. Plants, 15.
 Cocks, Reginald T. Plants, 15; Seeds, 2 packets of 25 each.
 Cole, Mrs. John. Plants, 15.
 Colebrook, John. Plants, 15.
 Coltman, Mrs. F. Plants, 15; Seeds, 2 packets of 25 each.
 Cook, Mrs. E. J. Seeds, 1 packet of 25.
 Cooper, Robert. Plants, 26.
 Cooper, W. S. Plants, 20.
 Cocker, James. Plants, 13 varieties; Pelargonium, double, 4; Begonias, 2 varieties.
 Cox, John. Pears, 2 varieties (cuttings); Begonia, 1 variety
 Crofton, Mrs. Plants, 15.
 Cumming, J. Plants, 14.
 Cutbush, James. Vines, 14 varieties (cuttings); Fig, 1 variety (cuttings).
 Daniel, Miss. Plants, 28.
 Darbishire, Mrs. Plants, 15.
 Dauney, Mrs. Plants, 15.

Deacon, Miss J. B. Plants, 25.
 Dent, William. Plants, 14.
 Dickson, William Alfred. Plants, 23 ; Vines, 23 varieties (cuttings) ; Figs, 4 varieties (cuttings).
 Dolman, James. Plants, 19 ; Pelargoniums (zonal), 9 varieties ; Seeds, 2 packets of 25 each.
 Donnelly, Lt.-Col. Plants, 20.
 Downie, John Pelargoniums (zonal) ; 6 varieties (cuttings) ; Begonia ; 1 variety (2 plants). Fuchsia, 1 variety.
 Drummond, Hon. F. Plants, 20.
 Drummond, Hon. Mrs. Hay. Plants, 12.
 Drummond, Walter. Plants, 30.
 Du Cane, Hon. Lady. Plants, 15.
 Duckworth, Mrs. Dyce. Plants 29 ; Seeds, 2 packets of 25 each.
 Duncombe, G. T. Plants, 25.
 Durant, H. W. Plants, 13.
 Denny, John. Plant, 1 variety, Ivy-leaved Geranium.
 Easton, Dr. J. Plants, 15.
 Easton, James, Junr. Plants, 27.
 Easton, Miss. H. M. Plants, 14.
 Edwardes, Thomas D., Junr. Eucalyptus globulus (1 plant) ; Gloxinias, 8 varieties (leaves).
 Eland, G. F. Plants, 28 ; Gooseberries, 6 varieties (cuttings) ; Currants, 9 varieties (cuttings).
 Elliott, S., Junr. Plants, 14.
 Elliott, H. G. Guy. Plants, 27 ; Seeds, 2 packets of 25 each.
 Elwes, H. J. Plants (Himalayan), 70 varieties ; Saxifraga Nepalensis (6 plants) ; Plants, 44 ; Seeds, 4 varieties.
 Emerton, William. Plants, 6 ; Pelargoniums (zonal), 12 varieties ; (double), 8 varieties.
 Erskine, Miss. Plants, 20.
 Evelyn, Mrs. Col. Seeds, 2 packets of 25 each.
 Eyre, Thomas J. Plants, 30 ; Lonicera, 2 varieties (cuttings).
 Feilden, Rev. John. Plants, 15 ; Seeds, 2 packets of 25 each.
 Fellowes, Mrs. C. J. Plants, 17.
 Fenwick, Mrs. C. R. Plants, 14.
 Fenwick, Mrs. Henry. Plants, 27 ; Currants, 4 varieties (cuttings) ; Pears, 6 varieties (cuttings) ; Apples, 8 varieties (cuttings) ; Gooseberries, 6 varieties (cuttings) ; Strawberries, 3 varieties (cuttings).
 Field, John. Pelargoniums (zonal), 6 varieties.
 Filmer, The Dowager Lady. Plants, 20.
 Finzel, Conrad William. Plants, 16.
 Fisher, John. Plants, 15.
 Fraser, John. Vines, 15 varieties (cuttings) ; Figs, 2 varieties (cuttings) ; Currants, 1 variety (cuttings).
 Friend, Henry S. Plants, 14.

Fryer, W. R. Plants, 18.
 Gardner, Capt. Thomas. Plants, 20.
 Gatliff, W. Hoey. Plants, 24.
 Geary, Lady. Plants, 12.
 Gebhardt, Mrs. Plants, 15; Strawberries, 1 variety (100).
 Gladwin, Mrs. H. F. Plants, 15.
 Glentworth, Viscountess. Plants, 20.
 Goddard, Ambrose L. Plants, 13; Fuchsia, 3 varieties (cuttings).
 Goding, Mrs. H. Plants, 14.
 Gordon, Mrs. Plants, 27.
 Gordon, William Hamilton. Plants, 15.
 Gossett, J. J. Seeds, 1 packet of 25.
 Gower, Robert F. Plants, 12; Pelargoniums, 6 varieties;
 Pears, 7 varieties (cuttings); Apples, 7 varieties (cuttings).
 Graham, Mrs. Plants, 30.
 Gray, James. Seeds, 2 packets of 20 each.
 Grimshaw, J. S. Plants, 20.
 Grover, Captain G. E. Plants, 24.
 Guedalla, Henry. Plants, 15.
 Gumbleton, W. E. Abutilons, 2 varieties.
 Hamilton, Mrs. Plants, 18; Seeds, 1 packet Dianthus;
 Geraniums, 6 varieties (cuttings).
 Hanbury, Robert. Plants, 15; Seeds, 2 packets of 25 each.
 Harcourt, Col. F. V. Seeds, 2 packets of 25 each.
 Harcastle, J. A. Plants, 25.
 Harradine, Thos. Plants, 20.
 Harrington, Elizabeth, Countess of. Seeds, 1 packet of 25.
 Harrington, Mrs. Plants, 12.
 Harrison, Matthew. Plants, 10.
 Harrison, Wm. Plants, 26.
 Haughton, William, Plants, 18.
 Hope, Miss. Cape Pelargonium, 3 varieties; Plants, herbaceous,
 3 varieties; Pelargoniums, 6 varieties (cuttings).
 Hawkins, Rev. R. M. Seeds, 2 packets of 25 each.
 Haywood, T. B. Plants, 20. Apples, 12 varieties (cuttings);
 Pears, 5 varieties (cuttings); Strawberries, 5 varieties, 50
 each; Violas, 12 varieties.
 Heath, Rev. J. M. Seeds, 2 packets of 25 each.
 Herford, C. Lindsay. Plants, 16; Violas, 6 varieties; Straw-
 berries, 4 varieties (50).
 Hill, T. D. Plants, 23.
 Hogg, Robert. Plants, herbaceous, 32 varieties; Saxifragas,
 12 varieties.
 Holford, Mrs. R. S. Plants, 12 varieties.
 Holt, Jas. Maden. Seeds, 1 packet of 25.
 Holt, Mrs. Seeds, 1 packet of 25.
 Hornby, Mrs. Plants, 17; Strawberries, 4 varieties (50).

Houghton, Mrs. C. G. G. Plants, 30.
 Howard, Lady (of Glossop). Plants, 30.
 Hubert, Samuel Morton. Plants, 15.
 Hudson, J. G. Plants, 15.
 Huggins, Mrs. Plants, 15.
 Huntingfield, Lady. Plants, 12.
 Jacob, W. H. Plants, 22.
 Jefferies, W. J. *Eucalyptus globulus*, 2; *Cupressus Lawsoniana argentea*, 1.
 Jervis, Hon. Caroline M. F. Seeds, 2 packets of 25 each.
 Jersey Horticultural Society. Plants, 43 Seeds, 20 packets of 25 each.
 Jones, J. Pateshall. Seeds, 2 packets of 25 each.
 Jones, Mrs. Charles. Plants, 18.
 Kelso, C. G. L. Seeds, 2 packets of 20 each.
 Kemp, Rev. George. Plants, 11; Plants, herbaceous, 6 varieties; *Pelargoniums*, 13 varieties (cuttings); Seeds, 2 packets of 25 each.
 Kennedy, Major William. Plants, 2 (Virginian creepers).
 Kilvington, Mrs. F. Plants, 25.
 King, John. Plants, 20.
 King, J. H. Plants, 15.
 Knightley, Lady. Plants, 15.
 Kinghorn, F. R. Vines, 7 varieties (cuttings).
 Laing, John. Vines, 13 varieties (cuttings).
 Laing, Mrs. Seton. Plants, 25.
 Lambert, Major-General. Plants, 11.
 Lancaster, Benjamin. Plants, 15; Seeds, 1 packet of 25.
 Lang, George Murray. Plants, 25.
 Law, J. S. Plants, 29.
 Lawden, Thomas Tipping. Plants, 15.
 Lawrence, Sir Trevor, Bart., M.P. *Dendrobium linguæforme*, 1 plant; *Begonia Moonlight*, 2.
 Leaf, C. J. Plants, 19.
 Lee, Charles. Vines, 17 varieties (cuttings).
 Legh, William John. Plants, 27.
 Leinster, The Duke of. Plants, 30.
 Lempriere, R. R. Seeds, 2 packets of 25 each; Plants, 25.
 Lewin, Mrs. Plants, 26.
 Lloyd, Edward. Plants, 26; *Violas*, 6 varieties; Strawberries, 3 varieties (50).
 Longford, Earl of. Plants, 37.
 Ludlow, Thos. Vincent. Plants, 15.
 Lyon, Thomas. Plants, 16.
 Macleay, Sir George, K.C.M.G. Plants, herbaceous, 12 varieties; *Iris*, 5 varieties; *Cannas*, 8 varieties.
 Maitland, Mrs. Plants, 15.

Manby, Charles. Plants, 19.
 Mason, Major. Plants, 18; Pelargoniums, 11 varieties.
 Matthews, John. Plants, 15.
 Mellor, Mrs. J. R. Plants, 27.
 Midlane, Mrs. Henry. Plants, 16.
 Montagu, I. Seeds, 2 packets of 25 each.
 Montgomery, Sir Robert. Plants, 30.
 Moore, Mrs. Wm. F. Plants, 12.
 Morley, John. Plants, 30.
 Mosse, G. Staley. Plants, 27.
 Nicholl, Rev. E. P. Plants, 14.
 Nottingham Hort. Society. Seeds, 20 packets (25).
 Nutter, Mrs. Plants, 28.
 Nevill, Lady D. Plants, 2.
 Oakes, H. Porteous. Plants, 14; Strawberries, 4 varieties (25).
 Okeden, W. H. P. Plants, 13.
 Oliverson, R. Plants, 27.
 Osborne, Sir C. Stanley. Seeds, 1 packet.
 O'Shaughnessy, R. Plants, 15.
 Paget, Rt. Hon. Lord C. Plants, 23.
 Paget, Mrs. Frederick. Plants, 15; Seeds, 1 packet of 25.
 Paine, William D. Plants, 19.
 Palmer, Edward Howley. Plants, 23.
 Parker, Lady. Seeds, 1 packet of 25.
 Parry, Mrs. Plants, 23.
 Pasley, Colonel C. Plants, 17.
 Paul, George. Nectarine (grafts).
 Payne, William. Plants, 21.
 Parker, R. Plants, 8; Fig, 1.
 Pearson, C. E. Plants, 4; Strawberries, 5 varieties, 100 of each.
 Peto, Lady. Seeds, 1 packet of 25.
 Portman, The Lord. Plants, 23.
 Potter, Mrs. Richard. Plants, 25.
 Pyke, Thomas. Plants, 30.
 Ranken, Mrs. Bayne. Plants, 14.
 Rashleigh, J. Plants, 27.
 Read, W. H. Rudstone. Plants, 13.
 Robb, Mrs. Plants, herbaceous, 40 varieties; Phloxes, 3 varieties; Plants, Himalayan, 4 varieties.
 Roger, A. Plants, 14.
 Rosher, Edward. Plants, 14.
 Rowland, Miss Sophia. Plants, 15.
 Rushout, Miss. Plants, 17.
 Sandbach, H. R. Plants, 24; Pelargoniums (zonal), 6 varieties.
 Saunders, T. B. Seeds, 2 packets of 25 each.
 Saunders, W. Wilson. Pelargoniums, Cape, 15 varieties; Fuchsias, 8 packets (cuttings).

Scotland, Sir Colley. Plants, 13.
 Sendall, James. Plants, 13.
 Sewell, Frederic. Plants, 15.
 Sheddon, Thomas. Plants, 23.
 Simpson, George. Plants, 15.
 Smith, F. T. Vines, 15 varieties (cuttings).
 Smith, George. Pelargoniums, 6 varieties.
 Smith, Henry E. Plants, 14.
 Smith, Matthew. Plants, 13.
 Snook, Miss A. L. Plants, 12.
 Spalding Horticultural Society. Seeds, 15 packets of 25 each.
 St. Ann's Horticultural Society. Plants, 48.
 Somes, Mrs. Plants, 29.
 Speed, Thomas. Asters, 30 varieties; Begonia, 2 plants.
 Spicer, W. R. Plants, 28.
 Stanley, Miss Sloane. Seeds, 1 packet of 25.
 Stewart, H. G. Murray. Plants, 24.
 Stewart, Miss E. Plants, 13.
 Streatfield, Mrs. Plants, 15.
 Strickland, Sir C. W., Bart. Plants, 13.
 Stuart, Charles Pole. Plants, 23.
 Sutton, William Lloyd. Plants, 25; Vines, 16 varieties (cuttings); Currants, 6 varieties (cuttings); Gooseberries, 6 varieties (cuttings); Figs, 2 varieties; Strawberries, 4 varieties (25).
 Sword, Alexander. Plants, 15.
 Syme, David. Vines, 20 varieties (cuttings).
 Symmons, W. Plants, 22.
 Tappen, G. C. W. Plants, 12.
 Teesdale, Mrs. F. S. Plants, 15.
 Templeton, Archibald. Plants, 26.
 Templetown, Viscountess. Plants, 15.
 Tenison, The Lady. Plants, 27.
 Thomson, J. Seeds, 1 packet of 25.
 Treeby, J. W. Plants, 14.
 Trevelyan, Sir W. C., Bart. Plants, 24.
 Tulk, Dr. John. Plants, 15.
 Turnbull, Henry B. Plants, 17.
 Turner, Charles. Vines, 5 varieties (cuttings); Plants, 100 Carnations.
 Ullathorne, Alexander. Plants, 18.
 Valpy, Mrs. Plants, 21.
 Veitch, H. J. Plants, 100 Carnations; Gooseberries, 36 varieties (cuttings).
 Vertegans, R. H. Plants, 18.
 Verulam, The Earl. Plants, 25.
 Wade, John. Seeds, 2 packets of 20 each.

Waggett, Dr. Plants, 26.
 Walford, Cornelius. Seeds, 2 packets of 20 each.
 Walker, Mrs. Edward. Plants, 17.
 Walker, Thos. E. Plants, 24.
 Walter, Jacob. Plants, 15.
 Walton, Charles. Plants, 15.
 Warner, Robert. Apples, 2 varieties (cuttings); Pears, 2 varieties (cuttings); Plums, 5 varieties (cuttings); Plants, 9.
 Warre, Chas. N. C. Seeds, 1 packet of 25.
 Waterlow, W. B. Abutilons, 2 varieties (cuttings); Pelargoniums, 11 varieties (cuttings); Succulents, 2 varieties.
 Watson, J. P. Plants, 27.
 Webb, E. A. Plants, 15; Chrysanthemums, 6 varieties (cuttings).
 Webb, Henry. Phloxes, 16 varieties; Plants, herbaceous, 7 varieties; Pelargoniums (zonal), 21 varieties; Gooseberry, 1 variety (cuttings).
 Webber, Charles. Seeds, 1 packet of 25.
 Weir, Harrison. Shrubs, 40 varieties Himalayan species; Vines, 1 variety (cuttings); Apple, 1 variety (cuttings); Gloxinias, 8 varieties (leaves).
 Weston, Alexander A. Plants, 15.
 Whitmore, John. Plants, 21.
 Whitmore, Mrs. C. S. Plants, 25.
 Whittingstall, Miss. Plants, 13.
 Williams, C. Henry. Plants, 14.
 Willing, James. Plants, 15.
 Wills, John. Plants, 200 Carnations.
 Wilson, G. F. Plants, 29; Eucalyptus, 3 varieties, 9 plants; Primula, 3 varieties, 6 plants; Currants, 13 varieties; Raspberries, 100.
 Wilson, Mrs. Plants, 12.
 Woodhouse, Mrs. C. M. Plants, 15.
 Woolf, Sidney. Plants, 24.
 Woolloton, Charles. Plants, 15.
 Wrench, Robert. Strawberries, 500; Raspberries, 100.
 Wyndham, Henry. Plants, 25; Seeds, 1 packet of 25.
 Wynn, Sir W. W., Bart. Plants, 26.
 Yeld, Mrs. G. Anson. Plants, 22.



